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BUREAU OF BUSINESS & ECONOMIC RESEARCH
COLLEGE OF BUSINESS ADMINISTRATION
MEMPHIS STATE UNIVERSITY

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MID-SOUTH QUARTERLY BUSINESS REVIEW

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LONGITUDINAL ASSESSMENT OF BUSINESSES IN A CENTRAL BUSINESS DISTRICT

*David M. Ambrose**

Introduction

The economic deterioration of central business districts has become a problem of increasing importance because urban deterioration has occurred in practically every major metropolitan area. The characteristics and seriousness of the situation have been cited frequently among urban planners. The studies conducted have illustrated quite clearly the economic and social impact of urban decay. Business enterprises as major components of the urban areas have been drawn into revitalization planning because these businesses are both dependent on and responsible to the central business districts. This article explores the attitudinal posture of the owners of a central business district toward the economic future of that district.

The literature is quite clear on the relative importance of reversing the deterioration of the major urban centers. The presence and relative roles of businesses are recognized [1]. Attention, however, has been focused upon the macroeconomic elements sought in the development of a resolution [2, 3]. The emphasis has been on the relative design of policy models for urban planners. In contrast, no reference was located which addressed the conditions or, more specifically, the attitudes of the individual businesses as occupants of the central business districts.

Background

The downtown core or central business district of Omaha, Nebraska, has experienced conditions of deterioration very similar to the blights of other major cities. This business district did not deteriorate beyond the point of no return before the condition was recognized. Early detection permitted the process of planning and redevelopment to commence while there was still viable commercial activity, particularly retailing, in the central core. This planning process began in the early 1970's and, although there were numerous businesses which either failed or elected to relocate beyond this district, 73 retail establishments remained as of the end of the 1970's.

By the mid-1970's only one major project—a new public library—was under construction. Although other significant projects were being discussed, there was no visible evidence that they would actually evolve. Since the first half of the 1970's had included many promises but no tangible progress, the business owners had little concrete encouragement for the future. Indeed, they could only watch while a significant number of well-established businesses closed their downtown retail stores. The prospects for the downtown corridor in 1976 can probably best be described as bleak and discouraging.

By 1980, the construction activities of the area had changed considerably. A large majority of the vacant and troublesome buildings had been demolished. Two major office complexes—a state office building and a telephone office headquarters—were nearing completion and being made ready for occupancy. A central mall park which had only been a plan five years before had been completed. Also, additional buildings with specified occupants were being planned for the immediate area. Several major buildings had had an exterior refurbishing. Finally, the mass exodus by businesses had nearly come to a halt. One might assess the retail conditions of 1980 as having bottomed out, and there were visible signs of revitalization of the area.

A survey was conducted in 1976 among the businesses in the area to determine their attitudes toward the future prospects of the downtown retail district. The study was designed to determine those factors which the retailers considered most important for the future of the area and thereby provided indications of the most significant problems to be resolved.

In 1980, this study was repeated with some changes which were designed to capture the new features of the area and the retailers' reactions to them. The primary purpose of this second phase was to assess the changes of attitudes which had taken place in the intervening period.

The study population was identified as those businesses which operated retail establishments in a narrowly defined geographic area commonly recognized as the central business district. Other businesses, such as professional offices, were deliberately excluded from the study. The research was designed to gather the attitudes of the retail business owners toward their continued involvement in the downtown business district and their attitudes toward the future. These included the levels of expected business activities, the perceived impact of proposed projects in the area, their assessments of the most significant problems confronting the business sector, and the actual operating experiences of these businesses. In addition, demographic profiles of the businesses were assembled.

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A mail questionnaire was employed in both studies to gather the needed data. No follow-up was used in the 1976 study and therefore only 21 responses were recorded. There were 46 respondents in the 1980 study which used both an initial mailing and a follow-up questionnaire.

Because of the relatively small populations of respondents, the data were assembled according to frequency of response and only limited cross-tabulations were constructed. Although the response rate was 29% in the first study and 60% in the second study, the limited population sizes did not permit exhaustive statistical testing of the data.

Several similarities were found in the demographic comparisons of the two study populations. The number of years of operation was found to be very consistent between the two populations. The average number of years of operation was 41.7 in 1976 and 36.9 in 1980—apparently a result of an increased number of "newer" firms participating in the second study as compared to the first. Many of the respondents operated retail stores in other locations. Therefore, an assessment was conducted of the relative importance of the downtown location to the operation of the total company.

The sales contributions of the downtown stores had remained about the same over the four-year interval as reflected in Table 1. Data in this table also illustrate that the downtown locations accounted for about the proportionate share of sales which might be anticipated by allocating sales according to the number of store locations.

Table 1

DOWNTOWN STORE SALES AS A PERCENTAGE OF TOTAL COMPANY SALES

	1976 Study		1980 Study		
Number of Branches for Each Store	Number of Stores	Average Sale Percentage of Downtown Store	Number of Stores	Average Sale Percentage of Downtown Store	Expected Proportion of Sales in Downtown Store
1	7	100	25	100	100.0
2	5	39	4	50	50.0
3			2	31	33.3
4	2	14	5	26	25.0
5	1	25	2	21	20.0
7			1	16	14.3
9			1	25	11.1
18			1	10	5.5
Non-respondents	6		5		

The businesses' operating experiences were assessed in each study. These were perceived experiences; the data in Table 2 are illustrative.

The sizes of the samples would not permit statistical testing, but there appears to be a slight shift of perceived experiences from the lower levels of satisfaction into the higher ranges of satisfaction.

The data from the 1980 study were further examined to determine if there were any patterns in sales according to the number of years the businesses had been in operation. The data indicated that there were no major differences in sales by length of operation. In other words, there is no grouping of businesses according to years of operation

Table 2

REPORTED CHANGES IN SALES

	1976 Study		1980 Study	
	1975 Sales as Compared to 1971 Sales		1979 Sales as Compared to 1975 Sales	
	Number	%Reported	Number	%Reported
Excellent-far surpassed	2	9.5	11	23.9
Good-slightly increased	6	28.6	13	28.3
Marginal relatively unchanged	6	28.6	7	15.2
Poor-less than	5	23.8	9	19.6
Deplorable	2	9.5		13.0
Non-respondents			6	
Total Number	21		46	

which are either experiencing all of the positive sales performances or, conversely, all adverse sales experiences. Looking into the future, a rather positive attitude and expectation of profits in the future existed, and there had been some changes between 1976 and 1980.

Table 3

CONFIDENCE IN FUTURE PROFITS

Years of Operation	Yes/ Profitable		No/Not Profitable		Don't Know/ No Opinion	
	Number	Percent	Number	Percent	Number	Percent
1980 Data:						
20 or less	11	68.7	2	12.5	3	18.7
21-40	9	75.0	1	8.3	2	16.7
41-60	4	66.7	2	33.3		
61-80	5	83.3			1	16.7
Over 80	4	100.0				
Mean	33	71.7	6	13.0	7	15.3
1976 Data:						
Mean	13	61.9	3	14.3	5	23.8

While the percentage of businesses reporting expectations of unprofitability had remained about the same (14.3% compared to 13.0%), there was a 10.0% increase in the number of responding businesses which indicated confidence that future profits would be increased (61.9% to 71.7%). However, the longer established businesses did have more confidence concerning the future.

These attitudes might be expected as years of experience do provide increasing degrees of confidence. However, the data were encouraging as they illustrated the relatively high levels of confidence and the indication of the continuation of the older and more established businesses.

The attitudes of the retailers about the problems of the downtown area over the four-year period had changed rather dramatically. Several important factors emerge from this information. First, the removal of vacant buildings and the associated debris eliminated some of the criticism about the physical condition of the downtown area. Parking was consistently important but relatively less important as several major complexes were com-

pleted and made ready for occupancy. Retailers' concern over consumer interest had also dropped. The most important shift was the retailers' belief that there needed to be improvement in the retail composition of the area—a factor which was not even reported in 1976. There were very positive implications in this shift. The retailers were indicating that they, rather than the government or public, must work to resolve the deficiency. Also, the development of a retail component has a futuristic orientation which might be implied from much of the reported 1980 data.

Table 4
MOST SIGNIFICANT PROBLEMS
OF THE DOWNTOWN AREA

	1976 Study		1980 Study	
	Number	Percent	Number	Percent
Retail composition			23	24.0
Parking	20	50.0	33	34.4
Clean up/debris	9	22.5	14	14.6
Crime	4	10.0	6	6.3
Consumer Interest	6	15.0	6	6.3
Entertainment-lack	1	2.5	6	6.3
Other			8	8.3

Note: Number of responses total to greater than the number of businesses as there was an opportunity for multiple responses.

The effects of several specific events or projects were tested in the two studies. The first was "special events" or merchant days which were intended to increase customer patronage of the central business district by drawing in a new customer base. While 47.6% considered these events to have a "positive impact" in 1976, only 32.6% gave a similar assessment in 1980. The retailers' attitudinal shift away from special events is consistent with other study information. In 1976, there were feelings of desperation and a support of anything which would even marginally increase the customer traffic, even if it were only for the day. In 1980, the attitudes were more positive: there was less dependency on the singular event for consumer patronage. The retailers probably realized that their operations were dependent upon the constant population of office and professional complexes and especially the new facilities which had been constructed in the area.

It was also possible to reassess the importance of the new public library among the retailers. While it was under construction in 1976, it had been operational for four years by 1980 and therefore experiences were reportable. While 38.0% of the businesses saw a positive effect in 1976, the opinions reported in 1980 indicated that only four businesses or less than 9.0% believed there was a significant increase in retail activity due to the completion of the public library. In summary, the building did little or nothing for the majority of the businesses in terms of retail trade.

Several major retail changes had been proposed at the time of the 1980 study and it was, therefore, appropriate that an assessment be conducted of the retailers' attitudes toward these projects. The first was the restructuring of a major department store, Brandeis, from an eleven-floor department store into only five floors of retailing and six floors of offices and professional space. As Brandeis was clearly recognized as the anchor store of the area and consequently of major importance to the continuity of downtown, retailers were asked for an assessment of the impact of this change on their retail business. Less than 20.0% considered the change to be detrimental, 30.0% considered it to be an actual improvement to their retail businesses, and 40.0% envisioned no impact. There was no apparent panic over the decreased retail emphasis in the Brandeis building.

The second major project was a proposal to construct a shopping mall within the downtown area. This mall was to be composed entirely of retail stores which were complementary to existing retail establishments. The retailers were asked if they would desire to become tenants of the new complex. Over 40.0% indicated a strong interest, while only 15.0% reported no interest. While no solid conclusions can be drawn from the retailers' stated intentions, the responses appear to be favorable. Again, these responses should be interpreted as another positive indication of the retailers' belief in the continuity and prosperity of the downtown business district.

Conclusions and Study Implications

Although the attitudes of the retailers toward the future economic prospects of the central business district were not encouraging, the changes in their attitudes over the four-year interval were in a positive direction. The importance of conducting and reexamining longitudinal research cannot be underestimated, as evidenced by these study findings. Urban planning can be more deliberate and confident through improved understandings gained from the research. These improvements would not have been possible through the singular examination of only the latest study. The primary value in the studies is the ability to identify the shifts of attitudes which have resulted in the interstudy interval.

The implications for the future are obvious: the attitudinal dispositions of the businesses must be reexamined at regular intervals. Attitudes are very important to many of the planning decisions of businesses as attitudes can precede, frequently by some distance, the actual business decisions. However, a greater sophistication in the research design could improve the values of the research findings.

The quantified data assembled in these initial studies were limited and related to the demographic profiles of the respondents. Studies of greater intensity which would measure financial activity, inventory levels, customer patronage, and retailing space allocations would enhance the research models. Through these added dimensions, assessments of the relative stability and performance of the businesses could be conducted. While these measurements would constitute an historical profile, they would assist in confirming the basis of the attitudinal dispositions of the businesses toward the future.

The research findings imply that business owners are learning to live with the more limited economic activity of

(continued on page 12)

EMPLOYEE ATTITUDES TOWARD MANDATORY RETIREMENT

*Carl C. Moore, Edward L. Harrison, and Paul H. Pietri**

In April 1978, Congress amended the Age Discrimination in Employment Act by raising retirement age from 65 to 70. For companies large and small the new law creates many new potential problems, but possibly includes benefits as well.

The law forbids forced retirement for non-military federal employees at any age solely on the basis of their age and for all other employees under the age of 70. Exceptions to the law include firms employing fewer than 20 persons, fire-fighters, air traffic controllers, certain law enforcement officers and civil servants, and those who have been executives for at least two years and are entitled to immediate non-forfeitable pensions of $27,000 a year or more. The law took effect for private sector jobs on January 1, 1979, and on January 1, 1980, for jobs covered by collective bargaining agreements. The law will become effective on July 1, 1982, for college and university professors.[1]

The introduction of a federal minimum for mandatory retirement is something of an anomaly in a country where the retirement age has been falling for decades. Today, the typical U.S. worker reportedly retires at about age 62, and only 21 percent of those 65 and over are still employed, compared to two-thirds as recently as 1910.[2] The question to be answered in the future is whether or not employees will choose to continue working after age 65. In some companies, which have never had a mandatory retirement age, the evidence indicates that the numbers will be small. For example, at Republic Steel Corporation, less than one percent of the 40,000 employees work past 65. The average age of retirees is below 62.[3] In contrast to professional and officer workers, production workers might be expected to retire at early ages due to the physically demanding nature of their labor. However, there is little evidence that a significantly larger percentage of the former workers continue to work.

In an effort to examine employee attitudes toward retirement, a survey of 143 subjects was completed in early 1979. Each respondent completed a questionnaire to determine his demographic and economic characteristics, as well as his attitude toward certain retirement questions. As shown in Table 1, the respondents represented a cross-section of people with respect to age, sex, family size, education, and years of employment with their present company. The sample was composed of the following groups: general managers, 25.9 percent; manufacturing employees, 28.0 percent; service related employees, 14.0 percent; and college students, both graduate and undergraduate, 32.1 percent.

Table 1

RESPONDENT PROFILE
(Percent of 143 Respondents)

Characteristic	Percent of Total	Characteristic	Percent of Total
Age:		Education:	
17-20	7.7	High school	22.5
21-35	62.2	Two years of college	40.1
36-50	18.9	College graduate	11.3
51-60	8.4	Post-graduate	26.1
Over 60	2.8		100.0
	100.0		
Sex:		Years With Present Company:	
Male	81.8	Unemployed (students)	24.5
Female	18.2	Less than 5 years	39.1
	100.0	5 to 10 years	18.9
		11 to 20 years	8.4
		More than 20 years	9.1
Family Size:			100.0
One	33.1		
Two	21.1		
Three	15.5		
Four	17.6		
Five or more	12.7		
	100.0		

The majority of the sample were 50 or less years of age (89.0 percent), which means that they were required to project ten or more years into the future. It is quite possible that present attitude toward retirement will undergo considerable change as the age in question approaches. The results, however, yield many interesting facts about the retirement issue.

Results

As indicated in Table 2, a majority of the respondents do not favor a mandatory retirement age (64.5 percent); however, 51.8 percent plan to discontinue work prior to

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[1]George Horwich, "Regulatory Retirement, the Indirect Cost," *Regulation*, May-June, 1978, p. 27.

[2]Ibid.

[3]"Looking Out on Later Retirement," *Time*, January 15, 1979, p. 62.

MID-SOUTH ECONOMY

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STATISTICAL SUPPLEMENT

MID-SOUTH QUARTERLY BUSINESS REVIEW

THE MEMPHIS ECONOMY

There was a great deal of improvement in August building construction contracts awarded in Memphis from last year. Unemployment declined to 6.1 percent of the civilian labor force from 6.4 percent in July. A year ago unemployment was 4.8 per cent.

Total non-agricultural wage and salary employment of 353,700 declined 1.7 percent from August 1979. Manufacturing employment, which has been declining since the second quarter of 1979, decreased 5.3 percent over the year. Durable goods employment decreased 4.7 percent and non-durable, 5.7 percent. Non-manufacturing employment lost 0.9 percent over the year. Small gains were made in construction employment, finance, insurance, and real estate, and in service employment.

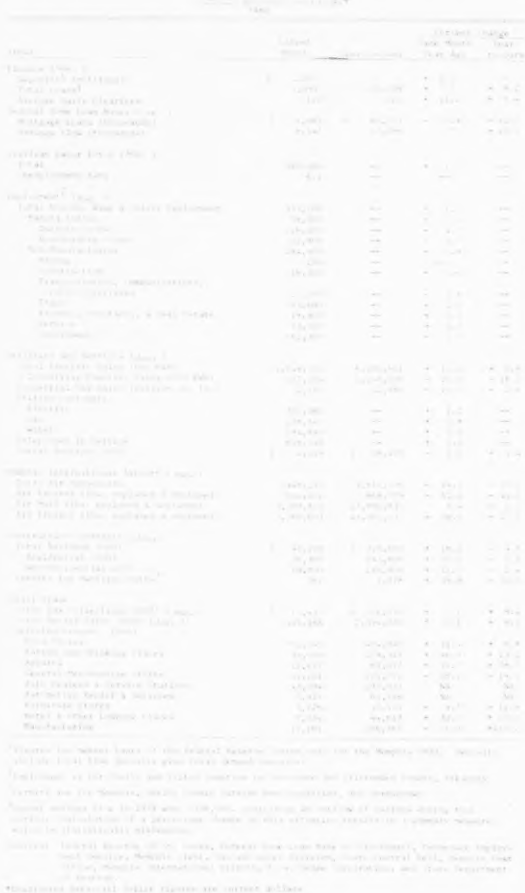
Activity at the Memphis International Airport continued to have large declines in August due to high fuel costs, inflation, and the depressed economy. Total air passengers were down 24.5 percent; air express, 62.1 percent; air mail, 3.4 percent; and air freight, 26.2 percent from a year ago. Total air passengers for the eight-month period were down 17.7 percent from the same period in 1979.

Total electric sales were 11.0 percent higher in August than a year earlier. The year-to-date total was up slightly less than one percent. Industrial electric sales and industrial gas sales declined 20.3 percent and 10.5 percent, respectively, during the month from a year ago. Telephones in service at the end of August were 2.1 percent above a year ago, and postal receipts for the month declined 1.0 percent.

Mortgage loans made by Federal Home Loan banks declined 3.9 percent in August and 42.0 percent from January-August compared with the same periods in 1979. Savings flow for the month was $6,347,000, up from an outflow of funds in August 1979. The savings flow for January-August was 45.3 percent above last year.

Total building construction contracts for the month were 16.2 percent above a year ago, with residential building gaining 20.1 percent and non-residential, 11.1 percent. Permits for dwelling units, an indicator of future residential building, were 39.8 percent higher than in August 1979. Total building construction for the year-to-date was still 4.6 percent below last year.

Total estimated retail sales in July were $343.4 million, 6.1 percent above the same month last year. The seven-month total was 9.0 percent higher than in 1979.



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CONSTRUCTION 1980 August	United States	Mid-South States	Alabama	Arkansas	Louisiana	Mississippi	Tennessee	West Tennessee
Value of Construction Contracts Awarded								
Total Construction								
Percent Change Year Ago	+ 5.9	- 4.3	NA	- 0.9	+ 3.9	-23.6	- 5.7	+16.5
Percent Change Year-to-Date	-20.5	-50.6	NA	-31.4	-14.1	78.4	-54.0	- 4.2
Total Building								
Percent Change Year Ago	-11.1	-21.7	NA	+ 3.0	-58.8	- 3.3	+14.1	+29.3
Percent Change Year-to-Date	-16.3	-22.3	NA	-18.8	-27.8	-19.1	-18.6	- 6.2
Residential Building								
Percent Change Year Ago	-16.7	-13.1	NA	-13.4	-28.0	- 5.0	- 3.0	+31.9
Percent Change Year-to-Date	-26.7	-22.7	NA	-24.9	-23.5	-20.9	-21.6	- 9.9
Non-Residential Building								
Percent Change Year Ago	- 2.2	-31.1	NA	+50.4	-76.9	- 1.0	+40.3	+23.4
Percent Change Year-to-Date	- 0.1	-21.8	NA	- 5.1	-31.3	-15.4	-14.7	- 1.9
Public Works and Utilities								
Percent Change Year Ago	+75.6	+60.9	NA	-22.2	+384.3	-57.1	-71.6	-35.3
Percent Change Year-to-Date	-31.4	-76.5	NA	-58.7	+61.6	-93.1	-81.3	+ 6.4
Total Dwelling Unit Starts to Date	792,000	51,556	NA	9,438	14,789	9,231	18,098	4,605
Percent Change Year Ago	-42.1	-32.5	NA	-33.7	-37.5	-30.9	-28.2	-22.7

LABOR 1980	United States (July)	Mid-South States				
		Alabama (July)	Arkansas (July)	Louisiana (July)	Mississippi (July)	Tennessee (July)
Non-Agricultural Wage & Salary Employees	89,735,000*	1,332,100	737,500	1,541,400	813,500	1,740,700
Percent Change Year Ago	- 0.4	- 2.8	- 1.4	+ 3.1	- 3.3	- 2.6
Manufacturing Employment	19,742,000*	344,200	204,000	208,900	213,200	490,400
Percent Change Year Ago	- 6.6	- 8.4	- 7.0	- 2.2	- 9.5	- 7.0
Non-Manufacturing Employment	69,993,000*	987,900	533,500	1,332,500	600,300	1,250,300
Percent Change Year Ago	+ 1.5	- 0.6	+ 0.9	+ 4.0	- 0.9	- 0.8
Average Weekly Earnings of Production Workers in Manufacturing	$283.19	$257.15	$220.03	$322.18	$204.82	$236.07
Percent Change Year Ago	+ 5.6	+ 7.2	+ 6.9	+15.0	+ 6.3	+ 7.3
Unemployment Rate 1980	7.9	11.1	8.7	6.5	8.0	8.5
1979	5.8	8.0	5.5	7.1	6.0	6.8

*Seasonally adjusted.

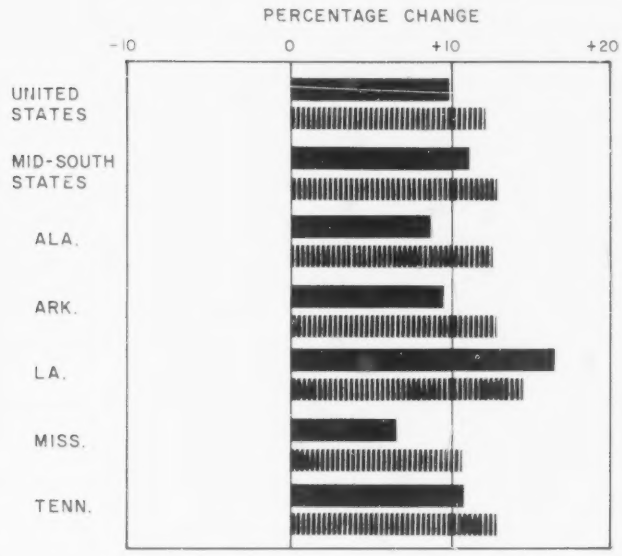
FINANCE 1980	United States*	Mid-South States District 8 Only	Alabama District 6	Arkansas District 8	Louisiana District 6 Only	Mississippi District 8 Only	Tennessee District 8 Only
Member Banks as of 7/30/80 Percent Change from Comparable Date 1979							
Total Loans	+ 6.2	+ 1.2	NA	- 0.5	NA	+ 5.9	+2.8
Total Deposits	+ 7.7	+ 4.5		+ 4.5		+ 8.4	+3.5
Net Demand Deposits	+ 3.1	- 7.2		- 8.0		- 5.8	-6.1
Time Deposits	+10.3	+10.4		+10.5		+15.2	+9.1

* United States data are for all domestically chartered commercial banks except for branches of foreign banks.

SAVINGS AND LOAN ACTIVITY 1980	Alabama (July)	Arkansas (July)	Louisiana (July)	Mississippi (July)	Tennessee (August)
Mortgage Loans Made (millions)					
Percent Change Year Ago	-33.5	-37.8	-38.7	- 26.8	- 1.1
Percent Change Year-to-Date	-49.1	-29.9	-34.3	- 40.5	-39.8
Net Savings Flow (millions)					
Percent Change Year Ago	- 8.0	+11.1	+31.3	+910.1	+54.9
Percent Change Year-to-Date	-19.4	-56.1	+16.8	+ 37.6	+21.3

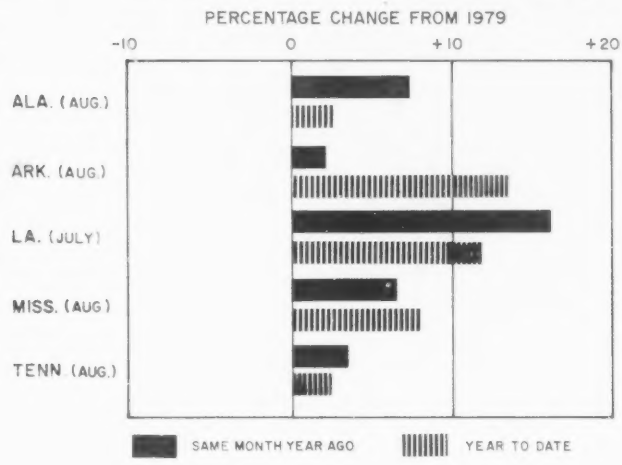
Sources: Departments of Employment Security; F. W. Dodge Reports; Federal Reserve Board of Governors; Federal Home Loan Banks of Little Rock, Cincinnati, and Atlanta; Survey of Current Business.

PERSONAL INCOME - JUNE, 1980

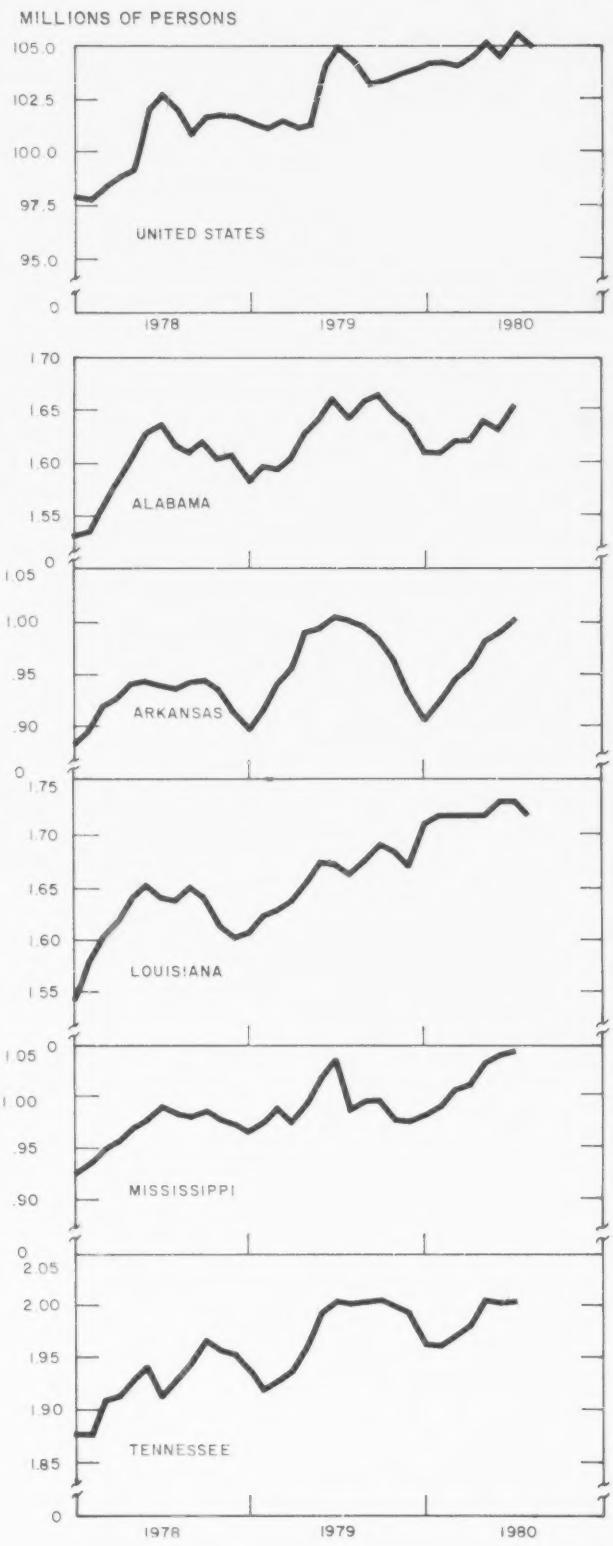


SOURCE: BUSINESS WEEK, OCT. 20, 1980

SALES TAX COLLECTIONS 1980



CIVILIAN LABOR FORCE



TENNESSEE COMMENTS

Personal income growth in Tennessee did not keep up with inflation, although it exceeded the growth rate in the Nation. Sales tax collections, an indicator of sales, were up only 2.4 percent for the January-August period compared with the same period in 1979—much less than the rate of inflation.

Tennessee non-agricultural wage and salary employment of 1,740,700 in July was 2.[illegible]ercent below July 1979. Manufacturing employment was down 7.0 percent for the month, only a little more than the 6.6 percent decline in the Nation. Average weekly earnings of production workers in manufacturing were $236.07, an increase of 7.3 percent. Average earnings were 83.4 percent of those for the Nation, up from 82.0 percent a year ago.

Unemployment in the state in July was 8.5 percent compared with 7.9 percent in the Nation. A year earlier unemployment was 6.8 percent.

Total construction contract awards in August showed a 5.7 percent decline from last year. Total building awards increased 14.1 percent, a better performance than in the other regional states or the Nation. Public works and utilities construction awards fell 71.6 percent from last year compared with an increase in the Nation of 75.6 percent.

West Tennessee showed considerable improvement in construction activity in August. Total construction contract awards increased 16.5 percent, with total building increasing 29.3 percent. Public works and utilities awards decreased 35.3 percent, although the year-to-date total increased 6.4 percent.

Member banks of the Federal Reserve System in West Tennessee had an increase in total loans of only 2.8 percent and in total deposits of 3.5 percent from a year ago. Net demand deposits decreased 6.1 percent, while time deposits increased 9.1 percent.

THE MID-SOUTH ECONOMY

United States personal income in June was only 9.9 percent above a year ago. The gain for the Mid-South was slightly higher, 11.1 percent; but Louisiana was responsible for the regional high. Alabama, Arkansas, and Mississippi had smaller increases than did the United States, and Tennessee did not match the regional increase.

The latest sales tax collections, an indicator of retail sales, showed the volume of goods sold in the region to be less than a year ago because of the high inflation rate.

Non-agricultural wage and salary employment in the five Mid-South states had a loss of 1.2 percent in July from the year before. The Nation had a 0.4 percent loss. Louisiana was the only state having an increase, 3.1 percent. Manufacturing employment declined 6.6 percent in the United States, with all the regional states having losses. Louisiana was the only state having a smaller decrease than the Nation. Non-manufacturing employment increased 1.5 percent in the Nation, 0.9 percent in Arkansas, and 4.0 percent in Louisiana. The other three states had declines of less than 1.0 percent.

In July the unemployment rate was up 2.0 percent or more in the Nation and most of the region. Louisiana had the lowest unemployment rate in the region as well as an improvement from the year before. Alabama had the highest unemployment in the Mid-South, 11.1 percent, and was the only regional state having a decline in the civilian labor force.

Average wages of production workers in manufacturing increased 5.6 percent over the year in the United States. Louisiana was the only regional state having increases that more than matched the inflation rate. The small increases were caused by decreases in the hours worked in the Nation.

Total construction contracts awarded in the Nation increased 5.9 percent in August from a year ago. The gain was due to an increase of 75.6 percent in public and utilities construction awards. The four states in the Mid-South for which data are available had a total construction contract awards decrease of 4.3 percent, although they also had a large increase in public works and utilities construction. Total building declined 11.1 percent in the U.S. and 21.7 percent in the region. Arkansas had a 3.0 percent increase, and Tennessee had a 14.1 percent gain. The Nation and region had declines in residential building awards. Non-residential building awards increased in Arkansas and Tennessee but declined slightly in Mississippi. Louisiana had a large decrease, causing the four-state total to decrease 31.1 percent from a year earlier. Year-to-date totals in total construction contracts awarded, total building, and in public works and utilities were below last year in the Nation and in all the regional states except Louisiana, which had an increase in public works and utilities construction.

Dwelling unit starts to-date declined 42.1 percent in the United States and 32.5 percent in the region. None of the Mid-South states had as large a decline as in the Nation.

The Federal Home Loan banks reported that net savings flow was up from a year ago in four of the five regional states. Alabama had an 8.0 percent decline, although it was less than the year-to-date decrease. Arkansas also had a large decline in the year-to-date total.

Mortgage loans were down from last year in the monthly comparisons and in the year-to-date totals in all five states.

Data for member banks of the Federal Reserve System for West Tennessee, North Mississippi, and all of Arkansas show total loans up 1.2 percent from a year earlier. Data for all domestically chartered commercial banks in the U.S. showed a 6.2 percent increase in loans. None of the states matched the national gain. Total deposits were higher in the Nation, with a 7.7 percent increase, than in the region, with a 4.5 percent increase.

reaching the previous mandatory retirement age of 65. In addition, 72.6 percent of the respondents indicated that they would retire before age 60 if their retirement benefits would allow them to maintain their present standard of living. For those that indicated that they would like to work until retirement age, the most frequent reasons for doing so were: (1) the desire to be active, (2) financial considerations, and (3) interesting work. Ironically, 14.3 percent of the respondents did not know whether their employer had a mandatory retirement age or not.

Table 2
SUMMARY OF SURVEY RESPONSES

Question		% Response
1. Do you favor a mandatory retirement age?	Yes	35.5
	No	64.5
(a) If yes, would you favor the retirement age being extended beyond age 65?	Yes	24.0
	No	76.0
2. Does your present employer have a mandatory retirement age?	Yes	66.7
	No	19.0
	Don't Know	14.3
3. Looking forward to the future, do you desire to work until you reach a mandatory retirement age?	Yes	48.2
	No	51.8
(a) If yes, indicate your reasons:*		
1. Interesting work		25.8
2. Financial considerations		30.7
3. Company loyalty		6.3
4. Desire to be active		35.0
5. Relationship with fellow workers		14.7
6. Other		4.2
4. Assuming your retirement benefits would allow you to maintain your present standard of living, at what age would you like to retire?		
(a) Before 50		27.5
(b) 50 - 60		45.1
(c) 61 - 65		15.5
(d) 66 - 70		9.1
(e) Over 70		2.8

* Total exceeds 100% since it was possible to indicate more than one response.

Responses to the retirement questions were cross-classified with the demographic data to examine any differences of response relative to age, sex, education, family size, and years of employment with the present company. Chi-square analysis was used to determine any statistical differences in responses. The results of the chi-square analysis are presented in Table 3. The age at which an employee would like to retire was the only retirement question found to be statistically significant (at the .05 level) when compared to the classification characteristics. Respondents in the 21-35 and 36-50 age categories indicated a greater preference to work beyond age 65 than did those in the 51-60 and over 60 age groups. Respondents who were college graduates indicated a stronger preference for working beyond age 65, which may reflect the fact that many hold more challenging and rewarding jobs, or they anticipate such positions at age 65. Finally, employees with ten or fewer years of experience with their present company indicated a stronger preference for working beyond 65 than did those with more than ten years of experience, a finding likely to be related to the preferences based on age mentioned above.

TABLE 3
CHI-SQUARE ANALYSIS OF RETIREMENT ATTITUDES VERSUS CLASSIFICATION CHARACTERISTICS

Retirement Question / Classification Characteristics	Age	Sex	Level of Education	Years of Employment With Present Company
1. Favor extending retirement beyond age 65	10.8[a]	3.2	10.5	13.1
	(.2592)[b]	(.2015)	(.2299)	(.1080)
2. Age you would like to retire	27.3*	3.8	46.2*	26.7*
	(.0380)	(.4128)	(.0001)	(.0448)
3. Reasons for working until a mandatory retirement age				
a. Interesting work	4.5	.60	3.8	5.0
	(.3459)	(.4353)	(.4357)	(.2873)
b. Financial considerations	7.5	.64	5.2	5.4
	(.1180)	(.4242)	(.2674)	(.2487)
c. Company loyalty	7.8	.04	1.8	3.6
	(.0977)	(.8425)	(.7725)	(.4628)
d. Desire to be active	3.9	3.0	3.4	3.2
	(.4130)	(.0845)	(.493.)	(.5249)
e. Relations with other workers	5.9	1.7	1.4	2.2
	(.2085)	(.2790)	(.8442)	(.6990)

[a]Chi-square value.

[b]Level of significance.

*Statistically significant at the .05 level.

Implications for Employers

Although there have been voices of doom spelling out the consequences to befall employers as a result of raising the mandatory retirement age, the results of this study suggest that many of the fears may be unfounded. A majority of the respondents indicated current plans to cease work before reaching age 65. Moreover, 72.6 percent indicated that they would retire before age 60 if retirement benefits would allow them to maintain their present standard of living. Admittedly, with the current inflation rate, most people would like to maintain their present standard of living while *working*, not to mention doing so after retirement. Nonetheless, these results suggest that the elevated mandatory retirement age will not present an immediate problem for most employers. Other writers have noted a similar unwarranted concern on the part of some experts with regard to the impact of the retirement amendment.[4]

However, for employers to conclude that long-run changes will not occur may prove to be costly. There are several areas on which employers should focus attention to determine whether adjustments will be required. Although the results of this study indicate that current

[4]Michell S. Novit, "The Retirement Amendments: Why the Concern?" *Business Horizons*, February, 1979, pp. 22-32.

employees do not plan to work to age 70, this may not be the case in the future. Accordingly, employers should be prepared to deal with a situation in which greater numbers of employees may want to retain their employment. When the persons who were a part of the baby boom following World War II reach the 65 to 70 age range, there will be comparatively enormous numbers of potential retirees.

In addition to the fact that there will be greater numbers of potential retirees in the future, employers will have fewer options available for dealing with employees of normal retirement age. Mandatory retirement has often provided a means of removing employees who have surpassed their capacity for productive contribution. In the future employers must plan more skillfully for new ways to deal with the marginal or non-productive employee who is retirement eligible but who elects to continue working. In the past, such cases were so relatively few that employers were able to either tolerate their mediocrity or to shift them to less meaningful positions. Others arbitrarily retired the employees without regard for their wishes. If significantly larger numbers *do* elect to continue working past age 65, employers will be faced with a new problem. No longer will it be feasible to shift employees to other jobs, because it is likely that there will be more employees than jobs. The potential discrimination factors combined with the large numbers in the affected class make it unwise for employers to deal arbitrarily with such employees. Thus, programs must be developed under which employees whose performance has been objectively evaluated as being less than satisfactory can become more productive or humanely and progressively eased into retirement.

All of this calls for a substantial improvement in and validation of current performance appraisal systems. More stringent enforcement of the Age Discrimination Act will require employers to maintain documented evidence of the performance of those individuals who are to be retired. The courts are being increasingly involved in litigation challenging the validity of performance appraisal systems. For example, the discriminatory use of performance appraisals was addressed in *Brito v. Zia Company* (1973).[5] The court found that Zia had violated Title VII when it laid off several Hispanic employees on the basis of poor performance ratings. The performance appraisals were found to be flawed because of their subjective and unstandardized nature, which resulted in a disparate impact on Hispanic employees. Similar conditions can easily be found in the performance appraisals of employees covered by the Age Discrimination Act. Thus, employers will be required to treat performance appraisal systems much as paper-and-pencil tests are now treated. Appraisal systems must be developed as a result of a thorough job analysis and must be shown to be related to actual job performance.

The amendment also carries a potential impact on collective bargaining agreements. Seniority clauses, an integral element in most labor agreements, can become trouble spots for employers and unions which maintain rigid seniority procedures. Cases may develop in which employees who are over age 65 qualify on the basis of seniority for new and challenging jobs. In some cases these employees will not be able to perform this work as capably as younger employees with less seniority. In analyzing this potential problem, Werner and Dewhurst suggest that some jobs should be assigned without regard to seniority or that workers with functional limitations should not have access to overtime or job bidding.[6]

One question which management always asks it, "How much is it going to cost?" The retirement amendment has elicited this question on many occasions. The answers do not come easily, however. Although there is an apparent effect on some employee benefit plans, there are several options available to management, depending on the type of plan involved. If managements elect to give pension credit for service after age 65, an action which is not required under the new law, the additional cost of doing so should be offset by starting the benefits at a later age.[7]

In a survey of 127 corporations, the national consulting firm of Towers, Perrin, Forster, and Crosby found that more than half the firms will probably freeze the accrued pensions of their employees at age 65, even if the employees choose to work beyond that age.[8]

Health care plans may be modified to extend coverage beyond the current approach of filling in the gaps in Medicare by providing coverage which, when combined with Medicare, would be roughly equivalent to coverage provided for employees under age 65. Long-term disability insurance plans may be extended to provide coverage until age 70. The increased likelihood of disability beyond age 65 can mean significant increases in the cost of such plans.[9]

In summary, it is difficult to assess the impact of the new retirement regulation. This study suggests that its short-term effect may be minimal since slightly more than half the respondents plan to retire before age 65. The younger, better educated respondents were more inclined to desire to work beyond 65. As time passes, the acceptance of 65 as the traditional retirement age may decline and more people may plan careers beyond this age. During the anticipated "lull" suggested by the results of this study, management must plan for the long-term changes which are likely to be wrought by the new law.

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[5] *Brito v. Zia Company*, 478 F.2d 1200 (1973).

[6] Herbert D. Werner and Martha Dewhurst, "The Age Discrimination in Employment Act Amendments of 1978 and Their Effect on Collective Bargaining," *Labor Law Journal*, August, 1979, pp. 477-482.

[7] Donald E. Sullivan, "Never Too Old," *The Personnel Administrator*, June, 1978, p. 54.

[8] "Corporate Reaction to Age Discrimination Amendments," *The Personnel Administrator*, February, 1979, p. 7.

[9] Sullivan, p. 56.

ERRORS AND REGRESSION ANALYSIS FOR MANAGERIAL ACCOUNTANTS

*Linda M. Marquis**

Regression analysis as a tool for the management accountant has been widely acclaimed since the mid-1960's. Comiskey[1] began the movement with his application of regression analysis to cost behavior in the consumer finance industry. Benston[2] and Jensen[3] also developed applications of the regression model but focused more attention on the general requirements of the model. Since these articles appeared, the regression model has become a standard feature in accounting textbooks, particularly those oriented to managerial accounting and operations research/management science.

In light of this general acceptance at the academic level, a recent survey by Imhoff[4] yielded a surprising response. From a list of eight "choices" which 52 surveyed firms might have used for planning and control, regression and correlation ranked fifth. Only nine of the firms responding included this technique in their bag of management tools.

Presently, no answers exist as to why this situation occurs in practice. However, this article will address one possibility. Management accountants may not only be unsure of the results of the regression; more importantly, they may be unsure of the decision-making errors of this technique. A short example will clearly illustrate this point.

Example

The Wilson Company is a small manufacturing concern. Mr. Rose, the managerial accountant, is responsible for preparing forecasts of total manufacturing costs. Rose determines that two items, raw material purchases and labor hours, seem most likely to be accurate predictors of manufacturing costs. Using past years' data of Wilson Company, Rose runs a regression analysis and finds that the following equation appears to explain 75 percent of the variation in manufacturing costs:

$$Y = \$12{,}322 + 1.51\ X_1 + \$4.79/\text{hr.}\ X_2$$

where

Y is the estimated manufacturing cost,

X_1 is the total purchases of raw materials, and

X_2 is the number of labor hours.

Using this relationship, Rose can now determine a reasonable forecast of manufacturing costs.

Rose is now faced with a set of hypotheses on the estimated costs that he has determined:

H_O The estimated costs are unreasonable in amount.

H_A The estimated costs are not unreasonable in amount.

One of these statements must be true, but Rose does not know which is the correct hypothesis.

Obviously, this example is oversimplified. (A recent article[5] listed 19 independent items included in the original regression and, in the most accurate regression, 4 independent variables.) However, the example is adequate to illustrate the picture without confusing the basic problem in a quagmire of details.

The question now becomes whether to use the estimate determined by regression analysis and what are the results of an incorrect decision. This is illustrated in Figure 1 where a table of possible actions and possible states occurs. Using the example, Figure 1 may be interpreted as follows:

If the estimate is unreasonable and Rose decides the estimate developed by the regression is unreasonable, he has made a correct decision. No error results from this decision, and Wilson Company does not incur any unnecessary costs in relation to Rose's decision.

If the estimate is unreasonable (H_O is true), but Rose decides that the estimate is reasonable (rejecting H_O), then Rose has made an incorrect decision on the contract. If the estimate is unreasonably high, the cost of making this error is determined by the actions of the firm in response to the estimate. Some likely actions might be extending Wilson's line of credit unnecessarily or raising the selling price of Wilson's products to accommodate a higher-than-necessary estimate of costs. If the estimate is unreasonably low, the actions taken by Wilson may also be

**Department of Accounting, Tennessee Technological University, Cookeville, Tennessee.*

[1]Eugene Comiskey, "Cost Control by Regression Analysis," *The Accounting Review*, April, 1966.

[2]George J. Benston, "Multiple Regression Analysis of Cost Behavior," *The Accounting Review*, October, 1966.

[3]Robert E. Jensen, "A Multiple Regression Model for Cost Control — Assumptions and Limitations," *The Accounting Review*, April, 1967.

[4]Eugene A. Imhoff, Jr., "Management Accounting Techniques: A Survey," *Management Accounting*, November, 1978.

[5]Steve Larson and C. Mike Merz, "Operations Research at Boise Cascade," *Management Accounting*, February, 1978.

less than favorable to the firm's operations: a lack of consideration for financing needs or an improper change in the selling price of the products. The probability of making this error is the alpha risk; in quality control situations, this risk is known as the producer's risk because the cost of this error is borne by the producer.

If the estimate is not unreasonable and Rose concludes that the estimate is fair, he has again made a correct decision. No unusual or unnecessary costs to Wilson Company are incurred by this action.

However, if the estimate is reasonable (H_A is true), but Rose decides that the estimate is unreasonable (not rejecting H_O), he is making a Type II error. The most likely result of this type of incorrect decision will be the recomputation of the estimated costs and the ensuing actions highlighted as a part of the alpha risk. The probability of making this type of error is the beta risk; in quality control situations, the beta risk is referred to as the consumer's risk.

Figure I

States of Nature	Decision States	
	Do Not Reject H_O	Reject H_O
H_O is True	Correct Decision	Type I Error
H_A is True	Type II Error	Correct Decision

In managerial accounting situations, the error to be avoided is the Type I error. Usually, the Type I error will cost more in an internal management situation. Obviously for each situation, the specific costs of Type I errors and of Type II errors must be determined before pronouncing one form of error more harmful than the other. However, since the cost of the Type I error is usually borne by management (and since the cost to management of the Type I error usually is not as great as the cost of the Type II error), this example leads to the generalization that alpha risks might tend to be more interesting to management accountants than beta risks. Thus, the focus of this research is on the alpha risk assumed by the management accountant.

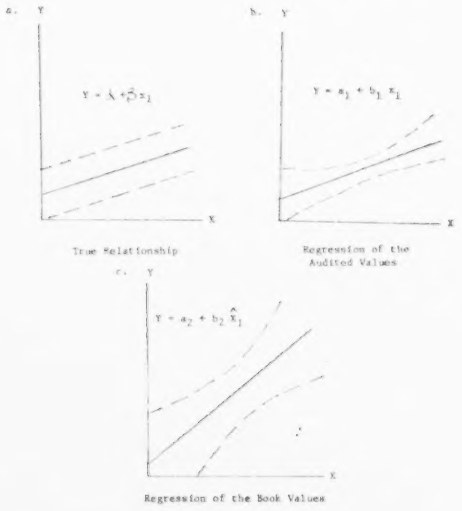
Research Design

A simulation procedure to investigate alpha and beta risks was developed and used. Simulation allows the computer to formulate many (in this case, hundreds) alternative situations. Clearly, this is much quicker than examining actual situations and is adaptable to many variations. Additionally, the tests are made in a totally controlled environment where extraneous, undocumented variables are omitted and the situation can be monitored with certainty.

Two accounting populations are simulated: an audited-value population (one that an auditor would perceive contains no material errors), and a book-value population (one that an auditor would perceive contains material errors). The use of the terms "audited-value" and "book-value" does not imply that book values are inaccurate and audited values accurate. These populations represent the independent variable of a regression analysis. The audited values are generated first and then, randomly, 10 percent of those are adjusted to contain material errors. The population with the 10 percent adjusted values is the book-value population. For both populations, the dependent variable values are the same; only in the independent variable values do errors occur. Each population is generated with a size of 36 to represent three years of monthly data.

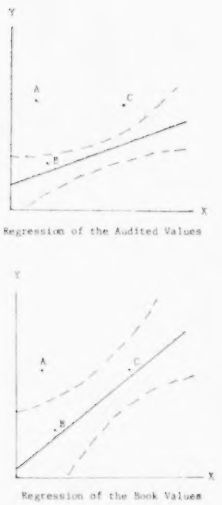
Using the generated da.., regression analyses are run on every population set. This results in two regression lines or equations and their corresponding confidence intervals. A hypothetical comparison is shown in Figure 2 with the true relationship as well as the two regressions. Figure 2-c is the relationship that would be employed (i.e., normally, audited monthly data are not available and if they were, the time of availability would probably be past the time of usefulness of the regression model).

Figure 2



With this information, tests of Type I errors can be made. Remember, a Type I error is a rejection of a true hypothesis. In this simulation, the true hypothesis is rejected if a correct value is observed outside the confidence intervals. Thus, 100 correct dependent variable values are simulated and used to test for Type I errors. In Figure 3, three possible dependent value points are shown in the regressions of audited values and of book values. If an accountant had observed point B, he would have accepted the null hypothesis using either regression model. If an accountant had observed point A, he would have rejected the null hypothesis using either regression model (in either model, this would be a Type I error). Point C is the item of interest. In the figure, point C lies

Figure 3



outside the confidence interval of the regression of the book values. Point C illustrates the difference occurring because of the errors in the independent variable. Expected alpha risks are calculated for each regression model by calculating the percentage of Type I errors for each regression model.

The test is run 150 times for each combination of input variables. (The input variables are the mathematical relationship of the error to the audited value and the distribution of the errors.) A comparison is made between the 150 alpha risks generated from the populations without errors and the 150 alpha risks generated from the populations with errors. The following t-test[6] is employed:

$$t = \frac{\overline{A}_1 - \overline{A}_2}{S_p \sqrt{1/n_1 + 1/n_2}}$$

where

$\overline{A}_1$ is the mean of the alpha risks generated from populations without errors,

$\overline{A}_2$ is the mean of the alpha risks generated from populations with errors,

n_1 is the sample size of the alpha risks generated from the populations without errors (150),

n_2 is the sample size of the alpha risks generated from the populations with errors (150), and

S_p^2 is the pooled variance of the two populations from which the samples are drawn.

[6]Wilfrid J. Dixon and Frank J. Massey, Jr., *Introduction to Statistical Analysis* (New York: McGraw-Hill Book Company, 1969), p. 116.

Results

For all simulations, the difference between the alpha risk of the regression of audited values and the alpha risk of the regression of book values is statistically significant. In examining the Type I errors and the expected alpha risks, one obvious result emerges. The alpha risk is consistently smaller when based on the regression of the book values than it is when using the regression of the audited values. For the managerial accountant concerned with the cost of making a Type I error, this result has positive connotations. In the decision-making process, the accountant need not be concerned with the absolute purity of the data. If the accounting data should contain errors, the chance of making a Type I error decreases rather than increases.

An explanation is in order at this point for the lack of presentation of the simulated results. The individual alpha risks that were simulated are only indications and not definitive results. The values depend strictly upon the generating process and can be manipulated with the simulation procedure. The differences in the alpha risks are the key results.

Conclusion

For the situation in which the cost of the Type I error is greater than the cost of the Type II error, the purity of the data is not of paramount importance. If the data do contain material errors, the probability of making a Type I error decreases.Thus, the results may be more precise than originally intended. Since the cost of the Type I error is usually greater than the cost of the Type II error in internal decision-making, regression analysis appears to be an acceptable tool for managerial accountants.

Limitations

Because of the methodology of the study, some limitations to the conclusion must be expressed. In the process of simulating the independent variables, the study by Neter and Loebbecke[7] provided the justification for using a gamma distribution as the form of the population of accounting data. However, some uses of regression analysis indicate that the independent variables may be items that do not have a gamma distribution (e.g., days of work in a month, gross national product, average daily temperature, etc.). Thus, these results are only valid for an independent variable of the gamma distribution form.

The occurrence of errors is a key element in the study. Sometimes the variables considered may be cumulative figures, composed of the sum of individual transactions. In the simulation, an assumption was made that the cumulative effect of the errors resulted in a material difference between the book value and the audited value. Another possibility that was not considered involves the material errors in the individual transactions which do not

[7]John Neter and James K. Loebbecke, *Behavior of Major Statistical Estimators in Sampling Accounting Populations* (New York: American Institute of Certified Public Accountants, 1975).

result in a material difference between the book value and the audited value. Whether this occurrence would have any effect on the decision-making process depends upon the situation. However, the possibility of this situation occurring is clearly not encountered in the research and must be considered when interpreting the results.

Finally, comparisons of the results of one simulation run with the results of another simulation run are highly questionable. The simulations all use the same random number seed and are not independent of each other. Comparisons between the simulations could be indicative of trends, but because of the lack of independence between the groups, no conclusions are reached and no results are shown.

(continued from page 5)

the central business district. Businesses tend to overreact to dramatic shifts in the economy, as evidenced by the responses of businesses to a recession period. These responses are partially psychological. However, business expectations do become established at levels which are more realistic. The businesses in the central business districts may have experienced similar events—near recessionary conditions—and may have overreacted partially from a psychological perspective.

Urban beautification and the construction of a public library are commendable improvements in the community, but they did little to instill economic confidence among retailers in Omaha. The appearances are that retailers were responsive to the increases in foot traffic with paycheck proceeds in their pockets—the employees of the telephone company headquarters and the state office complex. Sustained retailer activity will be dependent upon the continued improvement of the complementary economic structure of the downtown area.

The retail composition of the central business district of Omaha, Nebraska, will survive and prosper in the foreseeable future. The visual evidence of that survival is not yet readily apparent. However, the attitudinal foundation which is required for a successful retail district has already developed, as reported in the research. These two studies, taken as a longitudinal assessment, provide the first indications of the retention and improvement of the retail structure.

Just as these studies provided an insight into the improvements of the retail structure, similar studies would provide early evidence of deteriorating attitudes in otherwise apparently healthy retail sectors. Given signals of difficulties early enough, the resolution of the problems should be considerably easier rather than waiting until the devastation is clearly evident to everyone. Perhaps the greatest value in this research will be not the reversal of deteriorated central districts, but the maintenance and retention of the useful, functioning retail components of communities.

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THE CONSUMER PRICE INDEX: A MISUNDERSTOOD STATISTIC

*Harry A. Green**

Introduction

One of the most important, best known, and most misunderstood economic statistics in the United States is the Consumer Price Index (CPI). It is important because it has great effect on government transfer payments, wage-earners' cost-of-living adjustments (COLA), and cost adjustments on numerous types of contracts. It is one of the best known statistics, because every change in the CPI is widely reported in the communications media.

Over 50 million Americans have their incomes adjusted with every increase in the Consumer Price Index. For example, each increase of 1.0 percent in the CPI, if above 3.0 percent, triggers an increase of over $1 billion in social security benefits payments. This is measured from the first quarter of one year to the first quarter of the succeeding year. Thus, the CPI is by far the best known measure of inflation because of its wide use, but it is also widely misunderstood and misused.

The fact that the CPI is widely misunderstood is the subject of this article. Similar to other statistics, there is the tendency to ignore the assumptions inherent in its creation and to use it for purposes for which it was not intended, or for which it is ill-suited. In the following analysis the history, methodology, uses, and limitations of the CPI will be reviewed.

CPI: A Brief History[1]

The CPI, in basically its present form, was established in 1921. It developed from the various efforts of the Shipbuilding Labor Adjustment Board to adjust wages of shipyard workers to cost-of-living increases during World War I. As it developed, it was called a "cost-of-living index," although it has always been a price index. It continued to be called a cost-of-living index until World War II when it was changed to the more accurate and descriptive term "price index."

Beginning in 1919, the Bureau of Labor Statistics (BLS) began to publish semi-annual indexes for 32 large shipbuilding and industrial centers. These indexes were based on expenditure surveys of wage-earner and clerical-worker families for the period 1917-19. In 1921, BLS began publishing on a regular periodic basis. After a number of minor, periodic adjustments, the CPI was subjected to a comprehensive revision that was completed in 1940. Additional revisions were conducted in 1946, 1953, 1966, and most recently in 1978. These revisions were conducted to reflect changes in the consumption patterns of wage earners and clerical workers and to make adjustments in the weights assigned to the various categories of the index.

In spite of its relatively long history, the conceptual basis of the CPI has not changed much from its beginnings. It began as a measure of changes in the prices of a fixed market basket of goods and services, and it remains that type of index today. Numerous changes, of course, have occurred in the contents of the fixed market basket as a result of new consumer expenditure surveys. For example, the index underwent a comprehensive revision that was completed in 1940. The method of evaluating food items was changed so that specific weights were based on expenditure patterns in cities rather than in regions. Moreover, statistical methods were revised in an attempt to expand coverage to items not directly covered (through imputation), and the base period was changed to 1935-39.

World War II, as well as the post-war period, necessitated a number of changes. In 1949, Congress authorized a major three-year program to modernize the index. Ten years later in—1959—Congress once again authorized a major updating and revision of the CPI by BLS. This revision was not completed until 1964. Since its beginning, the CPI has undergone four (4) comprehensive revisions, each one more costly and more time-consuming than the previous one.

CPI: The 1978 Revision

The most comprehensive revision of the CPI to date was completed in 1978. It began in 1970 and focused on four major areas: (1) an updating of the weights assigned to spending categories such as food, clothing, shelter and medical care; (2) an updating of the monthly sample of items selected for pricing; (3) an updating of the sample of retail stores; and (4) a modernization of the conceptual basis and statistical methods employed in the CPI.[2]

Most of these changes are not visible in the published indexes, and it is very difficult to evaluate their significance. Currently, it is suggested that some of these changes may not have improved the reliability of the CPI at all. Alfred Kahn, President Carter's chief "inflation fighter," argues that the CPI overstates the rate of

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[1]For greater historical detail about the CPI, see U.S. Department of Labor, Bureau of Labor Statistics, *The Consumer Price Index: Concepts and Content Over the Years*, May, 1978 (revised).

[2]Ibid.

inflation by two (2) percentage points solely because of the method of treating housing and housing finance in the index.

Perhaps the most visible change in the CPI as a result of the 1978 revision is the creation of a new index (CPI-U) that purports to represent all urban consumers, approximately 80.0 percent of the total population. The previous index (CPI-W) represented only wage earners and clerical workers (approximately 45.0 percent of the population) and, as a consequence, was more limited. Because of its historical political significance, the Bureau of Labor Statistics decided to continue this index (CPI-W) along with the new index (CPI-U) at least through 1980.

One result of broadening the population base for the CPI-U is that the average annual income of the index population—urban consumers—is lowered. When the incomes of the unemployed and those not in the labor force, on the one hand, and the incomes of the salaried and self-employed, on the other hand, are added to the index population, the net result is a reduction in the average annual income.

Other changes include an expansion of the number of cities and Standard Metropolitan Statistical Areas (SMSAs) covered. Monthly or bimonthly indexes are now published for 28 cities compared with the previous 24 and for 85 SMSAs compared with 56. Moreover, the 1978 revision introduced regional indexes for cities of different population size classes in four regions: Northeast, North Central, South, and West. According to the BLS, this improves the reliability of the CPI on a national, regional, and city level.

It should be noted that this revision cost over $50 million and required around eight years to complete. However, most of these expenditures were made prior to 1975. In 1980 dollars, measured by the CPI, this cost would be around $65 million. *Ceteris paribus*, the next revision may cost $150 million.

Index Numbers

One of the most widely used of all economic statistics is the index number. The Consumer Price Index (CPI) is an index number, or, to be more precise, a composite index number. It is a composite index number because it is a combination of price changes measured in a series of individual index numbers. In the construction of price index numbers, statisticians rely heavily on the key concepts of time series, ratios, and averages.

The concept of price relatives is another indispensable tool in the construction of the CPI and other price indexes. Price relatives are determined by expressing the price of a commodity for a specified year as a percentage of the price of that same identical commodity in some specified prior year or base period. For more complex price relatives, the price of the commodity in each period is weighted by the quantity consumed in the base period, thus creating price aggregates. Price movement is then determined by dividing the latest price aggregate by the price aggregate of the base year. The approach used by the Bureau of Labor Statistics in the construction of the CPI is a modification of the well-known Laspeyres method. This will be analyzed in greater detail later.

An important point to remember about index numbers is that they constitute approximations of reality and not reality itself. They are used to render complicated economic phenomenon more comprehensible, but they are rarely precise.[3] Much of the basis for the construction of index numbers is arbitrary, and the results are subject to all the vagaries of that arbitrariness. Therefore, the use of index numbers as a basis for public policy decisions should be viewed with the greatest unease unless there is a comprehension of their inadequacies.

The Laspeyres Index

The most commonly used price index is the Laspeyres weighted aggregative type. It is so named because the basic methodology was developed by Etienne Laspeyres in 1864. It is a fixed-weight, fixed-base price index of the form:

$$PI = \frac{\Sigma p_n q_1}{\Sigma p_1 q_1} \cdot 100,$$

where p_1 is the price in the base year, q_1 is the quantity in the base year, and p_n is the price in the nth year of the series. The Consumer Price Index is equivalent to a weighted average of relatives using base year weights as value. As used by the Bureau of Labor Statistics, it follows the form,

$$CPI = CPI_{i-1} \left[\frac{\Sigma (p_{i-1}\, q_a)\, (p_i / p_{i-1})}{\Sigma (p_{i-1}\, q_a)} \right] \cdot 100,$$

where CPI_{i-1} equals the previous year index, p_{i-1} equals the price in the base year, and q_a is the quantity weights. When this is evaluated algebraically, it can be shown to reduce to a Laspeyres weighted aggregative index. However, the BLS uses this modified Laspeyres version in making its calculations rather than the algebraically reduced Laspeyres type. Thus, statistically, the CPI is an index of weighted aggregated average price relatives with base year weights. At the present time the base year is 1967.

The Paasche Index

There has always been some controversy over the use of base year weights. A contrary argument is that present year weights should be used to estimate the cost of a present year "market basket" in some specified prior year or base period. In other words, what was the cost in prior year X of a presently defined consumption pattern or "standard of living"? This takes the form of:

$$PI = \frac{\Sigma p_n q_n}{\Sigma p_1 q_n} \cdot 100.$$

[3]For valuable insights into the limitations of economic measurements, see Oscar Morgenstern, *On the Accuracy of Economic Observations* (Princeton: Princeton University Press, 1963).

The development of the current-period weights price index is attributed to H. Paasche in 1874. Similar to the Laspeyres index, it is a weighted aggregative index with the same advantages and disadvantages of that genre. The major difference between the two relates to the relative importance of the time definition of the "market basket" or goods and services. Moreover, it is generally held that while the Laspeyres method has an "upward bias" in measuring price changes, the Paasche method has a "downward bias"; that is, the former overstates and the latter understates price movements.[4]

Be this as it may, the Laspeyres method is the more widely accepted approach by economists and statisticians. However, in the succeeding analysis of the CPI, it should be noted that virtually all of the limitations of the Laspeyres method apply also to the Paasche method.

Consumer Price Index: Methodology

The Consumer Price Index (CPI) is a statistical measure, based on the theory of index numbers, of changes in the prices of goods and services bought by urban wage earners and clerical workers and urban consumers, that includes families and single persons.

The CPI is a weighted aggregative index number with fixed annual weights assigned to categories of consumer purchases. As such, it is referred to as a "market basket index." The CPI procedure is to measure price changes by repricing at regular time intervals and comparing aggregate costs of the goods and services purchased by consumers in a defined base period. The quantities of these goods and services are kept constant except at time of weight revisions.

The index represents price changes for "everything that people buy for living" including all taxes directly associated with the purchase of an item and its continued ownership.[5] The index deals with prices actually charged to consumers and includes sales and excise taxes and real estate taxes (but not income and social security taxes).

The following basic methodology is used in the construction of the CPI. Expenditure records are obtained from a sample of urban families and single persons. From these detailed expenditure data, index weights are derived from an objective selection of around 400 items that compose the market basket for current pricing.

The list of items priced includes all the most important consumer goods and services and a sample of less important ones. Once determined, the content of this market basket—in terms of items, quantities, and qualities—is kept essentially unchanged in the index calculation between major revisions so that any movements of the index from period to period are due solely to price changes.

To maintain the CPI, price data are collected from specified urban locations at intervals ranging from one to three months, but some items are surveyed only semiannually or annually. To insure that the index reflects only price changes and not quantity or quality changes, the Bureau of Labor Statistics (BLS) has prepared detailed specifications which describe the physical characteristics of the market basket items. If any of the items are not sold at the retail establishments surveyed, the BLS has detailed procedures for selecting alternative items.

For an indication of how the weights assigned to major consumer categories have changed, data for various benchmark years are presented below:

	CPI-W			CPI-U
	1935-39	1963	1978	1978
Food	35.4	25.2	20.5	18.8
Housing	33.7	34.9	40.7	43.9
Apparel	11.0	10.6	5.8	5.8
Transportation	8.1	14.0	20.2	18.0
Medical Care	4.1	5.7	4.5	5.0
Entertainment	2.8	3.9	3.9	4.1
Other Goods and Services	2.4	2.9	4.4	4.4

Limitations of the CPI

Alluded to in the foregoing analysis are some of the limitations of the CPI. Recent revisions have not solved these problems, and indeed some of the limitations are inherent in the methodology. As long as the fundamental concepts of the CPI are acceptable as valid, hence producing a desirable economic statistic, the limitations will remain *ad infinitum*. A more complete assessment of these limitations is presented in the following analysis. The limitations will be presented under the following headings: quality adjustment problem, the fixed weight-substitution problem, the varieties problem, the non-market problem, and the indexation problem.

The Quality Adjustment Problem

A major problem with the CPI, or any fixed-weight price index, is the measurement and adjustment of quality changes in the goods and services purchased by consumers. The reason for fixed consumption weights is very simply because of the need to be able to attribute consumer expenditure increases to price increases rather than quantity increases. The theory assumes the ability to create a statistical situation in which the standard of living is held constant so that any increase in consumer spending is clearly an increase in prices—and, by extension, the cost of living.

However, this also assumes that the quantities that are fixed also remain constant as to quality. Does frozen haddock today have the same quality as frozen haddock did in 1967, or is a new Plymouth of the same quality as a 1967 Plymouth? This is clearly a faulty assumption and constitutes a major problem for the CPI and all fixed-weight price indexes. In fact, as the Price Statistics Review Committee held in 1966, this may still constitute the "most important defect of these indexes."[6]

[4]A more complete analysis of this issue can be found in U.S. Congress, Joint Economic Committee, *Hearings, Part I*, "Government Price Statistics" (Washington, D.C.: 87th Congress, 1st Session, 1961).

[5]U.S. Bureau of Labor Statistics, *Handbook of Methods*, 1976, p. 70.

[6]U.S. Congress, Joint Economic Committee, *Hearings, Part I*, "Government Price Statistics" (Washington, D.C.: 87th Congress, 1st Session, 1961).

The dilemma is that there can never be an entirely satisfactory solution to this problem because consumer preferences are continually changing and the quantity weights and the base weights can only be changed infrequently. Moreover, economists generally accept the premise that quality changes have an "upward bias." That is, that quality improvements cause an increase in the price due to product improvements, not to inflation. Therefore, the arguments hold, the CPI and other fixed-weight indexes overstate the price increase and make the index rise too rapidly. To the extent that this is true, the CPI would, as a consequence, overstate the rate of inflation.[7]

There are other quality change possibilities, however, that also need to be considered. Just as some products and services clearly improve in quality, others probably decline. Indeed, there is the enigmatic possibility of rising prices and declining quality occurring simultaneously. Whether or not this actually occurs is a problem for empirical verification. However, opinion polls and numerous articles in the popular press indicate widespread belief that the quality of products and services is deteriorating. To the extent that this is valid, the CPI understates the rate of inflation.

There are three other quality change possibilities which should be considered. First, there is the possibility of a simultaneous increase and decrease in the quality of the same product. For example, specific improvements in American automobiles could occur, while the overall performance is deemed to decline. And since consumers are concerned about total performance, this would constitute a decrease in quality.

Secondly, there is the possibility that an innovation considered to be a quality improvement by the Bureau of Labor Statistics is considered the exact opposite by consumers. An example of such an innovation is pollution control devices on new cars. Because these devices are considered a quality improvement, BLS makes an adjustment to factor this out of new car prices. Therefore, for those consumers who do not view these devices as quality improvements, the CPI understates the increase in new car prices.

A third situation that needs to be considered occurs when quality improvements occur with product price reductions. A good example of this development is pocket calculators (but it might also apply to the entire field of consumer electronic products). One can buy a more elaborate calculator today at lower prices than one would have paid for a very simple calculator ten years ago, or even five years ago.

The Bureau of Labor Statistics is well aware that this quality problem exists and attempts to make quality adjustments in the CPI in cases of assumed product improvements. Is every assumed improvement an actual improvement? What about services? How can we measure quality changes in such consumer services as dry cleaning, restaurants, service stations, car repairs, and above all hospital and medical services?[8] What real effect do adjustments for quality have?

All of this suggests that the quality adjustment problem continues to be a major defect of the CPI.

The Fixed Weight-Substitution Problem

As indicated previously, fixed weights are used in the CPI because of the need to be able to determine that an increase in consumer spending is due to an increase in prices and not an increase in quantities purchased. The objective is to create a statistical situation in which a defined *constant-utility* consumption pattern—a fictitious standard of living—is measured in a time series to determine how much the cost of that particular standard of living changes as measured by price movements.

The fundamental defect with this proposition is what is called the substitution problem. The defined "market basket" of goods and services remains fixed only in a statistical sense because consumers change their spending behavior in response to price changes. The Laspeyres index assumes perfect price inelasticity of consumer demand, and this is known to be fallacious.[9]

Instead of an "identical market basket," consumers will strive to maintain an "equivalent" market basket by substituting less expensive products for more expensive products in response to high prices. Equivalent market baskets do not necessarily constitute reductions in the standard of living and may, in fact, constitute improvements. For example, a low-fat item such as chicken is more healthful than a high-fat item like beef; therefore, by substituting products and reducing spending, consumers may actually improve their standard of living. However, this would not be reflected in the Consumer Price Index. Therefore, the use of the CPI as a cost-of-living index is improper because it does not measure changes in the standard of living.[10]

Specifically, the Laspeyres index will always overstate price increases because of the fixed weights. Moreover, these overstatements will tend to occur with those commodities and services whose prices rise most rapidly because consumers will tend to substitute other goods for them, even if real disposable income remains constant.

Considerable research and attention have been devoted to the substitution problem over the years. Among professional statisticians, attempts to estimate the "substitution bias" in the CPI and other fixed-weight indexes is a well known phenomenon. However, these efforts have not produced much practical success. In a recent publication, the research department of the Federal Reserve Bank of St. Louis made the following assessment

[7]The "upward bias" argument is by no means universally accepted. Jack E. Triplett has argued that the "upward bias of the CPI is not conclusively confirmed by the available evidence"; see "Determining the Effects of Quality Change on the CPI," *Monthly Labor Review*, May, 1971, pp. 27-28.

[8]One way to provide supplemental information about changes in quality is to conduct periodic opinion surveys.

[9]Since consumer behavior changes over time, a fixed-weight price index like CPI loses economic meaning for a current period. However, if this was modified to use a method of changing weights, the value of the CPI as a statistical time series would be destroyed.

[10]In fairness to the Bureau of Labor Statistics, it should be noted that most BLS publications warn the reader about using the CPI as an estimate of current consumer spending patterns.

of the CPI:

> The increase in this index overstates the rise in the cost of living because it does not incorporate changes in the pattern of consumer expenditures. As prices in individual markets change, consumers reduce their purchases of those items whose prices are rising relative to all other prices. In addition, the CPI amplifies the effect of rising home prices and financing costs because it treats these increases as costs for both prospective and current homeowners. To current homeowners, a rise in housing prices represents an increase in the nominal value of their assets, not an increase in the cost of living. The homeownership component therefore produces a higher and more rapid rate of consumer price increases during periods of rising home prices and mortgage rates.[11]

This identical point was recently made by Alfred Kahn of the Council on Wage and Price Stability. In this regard, Mr. Kahn was quoted as saying that without the exaggeration of inflation caused by housing, the CPI would be two percentage points lower.[12]

The Varieties Problem

The sheer number of similar products available for consumption can be overwhelming. There are many products which come in a wide variety of brands, styles, sizes, colors, product capacity, packaging, and the like. Cars, breakfast cereals, canned foods, frozen fish, nuts and bolts, men's shirts, women's blouses, and thousands of other products manifest the achievement of the American economy to offer an unbelievably wide range of consumer choices.

In terms of the construction of a price index, this variety presents a significant statistical problem: To what extent should the price behavior of those varieties sampled be used to estimate the price behavior of those varieties not sampled. For example, consider the problem of constructing the price index for new cars. In the past, the CPI primarily selected Chevrolet, Ford, and Plymouth as its sample. Today, there is more variety than ever before in new cars, including numerous foreign products and many smaller, more fuel-efficient American cars (some of which are produced abroad by American companies and imported). The factors which drive price changes may be quite different in other countries, and, hence, it would be very difficult to assume that price movements for Volvos, Datsuns, Fiats, and Horizons will necessarily correspond. Thus, because of the varieties problem, it is possible to either understate or overstate price movements.

The Non-Market Problem

In a very technical sense, it is improper to discuss the CPI in a non-market context. The CPI is basically related to the private sector. However, in the context of a true cost-of-living index, it is appropriate to relate to non-market factors.

There are many factors which influence a specific standard of living or a general standard of living that are not usually included in a typical aggregative price index. The most notable factor is the broad array of governmental services, which range from national defense protection to garbage collection and disposal to human welfare services and public education.

The CPI was not designed to consider government services, and it does not. Yet, in our service-oriented economy, government services constitute an important part of the total services upon which our daily "standard of living" depends. Similar to private consumer services, there is widespread belief that the quality of government services is deteriorating. This may be another case of higher costs and reduced quality occurring simultaneously.

Another factor which the CPI does not measure is the externalities of production: those costs that accrue to the public in the form of air, water, and noise pollution and a variety of adverse environmental impacts. If producers had to pay these costs as a function of production, this increased cost would be reflected in higher product prices and hence in the CPI.

A true cost-of-living index would reflect considerations such as these.

The Indexation Problem

Perhaps the foremost reason for the creation of the CPI was an attempt to measure increases in the cost-of-living of workers for the purpose of adjusting workers' wages. Therefore, it is proper to discuss indexation in an evaluation of CPI.

As the preceding analysis has shown, there are a number of imperfections in the index methodology that distort the CPI. It is very difficult to estimate those distortions and adjust for them. In fact, it is probably impossible to measure and compensate for all the imperfections.

Since the CPI does not constitute a cost-of-living index, its unqualified use to escalate income payments, new wage contracts, service contracts, and in a variety of other areas, will result in distortions. The purpose of indexation and its use of escalators is to correct the redistributive effects of inflation. By the very nature of the CPI, its use for this purpose will overcompensate some and undercompensate others.

Therefore, if the redistributive impacts of the use of the CPI are not evaluated and, indeed, if there are winners and losers as a result of its rise, how can its use as an escalator be justified? There can be no question about it; those who do get indexed are better off than those who do not, and to the extent that others are never indexed, remain better off.[13] Thus, the use of the CPI benefits all those who

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[11]Federal Reserve Bank of St. Louis, *National Economic Trends*, November 30, 1979.

[12]For the period November 1978 to November 1979, the difference between CPI-U (all items) and CPI-U (all items) less shelter is only 1.0 percent.

[13]The experience with the Carter Administration's pay standards is that non-union wages rose only an average of 7.3 percent, while union wages rose an average 8.4 percent. The explanation for this is the existence of an escalator clause in many labor contracts that were not scheduled for renegotiation and, hence, not subject to the pay standards. See Paul Bennett and Ellen Greene, "Effectiveness of the First-Year Pay and Price Standards," *Quarterly Review* (Federal Reserve Bank of New York), Winter, 1979-80, pp. 50-53.

are indexed as opposed to those who are not indexed; and among those who are indexed, some are benefited disproportionately depending upon the inadequacies of the CPI.[14]

A general principle of index numbers is that the index should fit the exact purpose for which it was designed. In practice, there is no "family" of indexes available for the myriad demands to measure specific inflation rates. Therefore, there is the tendency to use the CPI for purposes for which it was not intended and, hence, to use it improperly.[15] Unfortunately, the impact of using the CPI as a proxy cost-of-living index, a cost-of-doing business index, or to measure the rate of inflation is rarely evaluated.

Evaluation and Conclusion

The decision to use a fixed-base, fixed-weight price index implicitly accepts the validity of the assumption that the most important economic changes in the future are price movements. This assumption would be valid only in a near static economy in which the quality of a fixed market basket of goods and services is unchanging. This is the *ceteris paribus* assumption, so necessary in economic analysis (and, indeed, in all social science research), the limitations of which must be clearly comprehended.

The danger of miscomprehension does not usually apply to those specialists in economic analysis. Their forte is a constant effort to improve the quality and validity of the measurement of economic phenomenon. Rather, the danger lies with those who use economic measurements as if they were absolute, precise, and completely accurate indicators.

This applies particularly to many users of the Consumer Price Index. The CPI with its fixed-base and base-period weights is particularly vulnerable to misuse during periods of rapid and cumulative economic change. Moreover, the influence of a major price-rise shock is of great concern. An example of such a price-rise shock is the large cumulative increase in the price of crude oil between 1973-1980. This large overpowering price rise was converted implicitly from individual price increases to general price increases in the "all items" average. This resulted in a significant over-contribution to the CPI, because it did not reflect the corresponding reduction in consumption of gasoline and petroleum-based products.[16]

Another example of a price-rise shock has been the cost of medical services. Medical costs have been among the fastest rising components of the CPI for the past fifteen years. Once again, individual price increases are converted into general price increases in the "all items" CPI. Each year, these increases are reflected in the CPI growth factor used to adjust social security payments. Because of the Medicare program, however, most social security recipients are protected from the large increases in medical costs. Consequently, the use of the All Items City Average CPI will overstate the inflation impact on over 35 million social security recipients.[17]

At the very least, if the CPI is to become a more reliable cost-of-living indicator, and a more reliable measurement of the inflation rate, frequent revisions of the market basket and the fixed weights will be necessary. However, this is a very difficult and expensive process. Each proposed change in the CPI must be carefully evaluated if its integrity as a fixed-item price indicator is to be preserved. Moreover, the most recent revision required eight years and cost over $50 million. This presents a clear trade-off dilemma: greater precision and accuracy of the CPI as a cost-of-living index versus considerably higher costs and constant revisions.

There is another alternative which would preserve the CPI as a statistical time series and yet provide statistical assessments of changes in consumption patterns. This can be achieved through the use of "experimental economics" which incorporates methodology from other social sciences.

The "treatment group/control group" methodology of social science would seem to offer significant possibilities for evaluating the changes in quality of products consumed and the changes in consumption patterns. At the time the consumer survey is conducted, appropriate consideration can be given to survey design so that a "control group" is established. Thereafter, additional surveys can be conducted periodically to determine and measure relevant changes in consumer behavior. This approach allows the traditional value of the Laspeyres method to be maintained while providing a measurement of actual change. This should be particularly valuable regarding payments to persons where income is indexed to the CPI.

The only way to construct reliable cost-of-living indexes is to design them for particular individuals and families. Even then, however, one can be sure that they will not remain accurate very long and certainly not for years.

The Consumer Price Index is a very valuable economic indicator. It provides relevant information about price increases in specific consumption areas over time that is very useful as an aid to economic decision-making. However, when the CPI is used as a cost-of-living index and escalator, it is used improperly because it cannot adjust to shifting consumer preferences. Moreover, when it is used as an inflation index to make non-consumer oriented adjustments, it is completely misused.

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[14]In his analysis of the problems of indexing the income tax, Edward F. Denison indicates that "it is not desirable to use the fixed-weight Laspeyres formula." See "Price Series for Indexing the Income Tax System," in Henry Aaron (ed.), *Inflation and the Income Tax* (Washington, D.C.: The Brookings Institution, 1976).

[15]Among the states that have adopted income tax indexation, most of them use the CPI. See Advisory Commission on Intergovernmental Relations, *The Inflation Tax* (Washington, D.C., January, 1980).

[16]Technically, it is incorrect to state that some component of the CPI "caused" a proportion of the estimated increase in inflation. A particular component may "cause" the CPI to rise, but that is quite different from stating that it "caused" inflation.

[17]It is possible that other components either overstate or understate the impact of inflation on retired persons. Overstatement and understatement of inflation may even "average out" in the CPI. At the moment, however, we have reasons to be concerned about the use of the CPI without a careful evaluation of its impact.

FEDERAL REVENUE SHARING WITH THE STATES: THE PERILS OF PAULINE AND THEIR EFFECT ON THE STATE FISC

*Howard P. Tuckman**

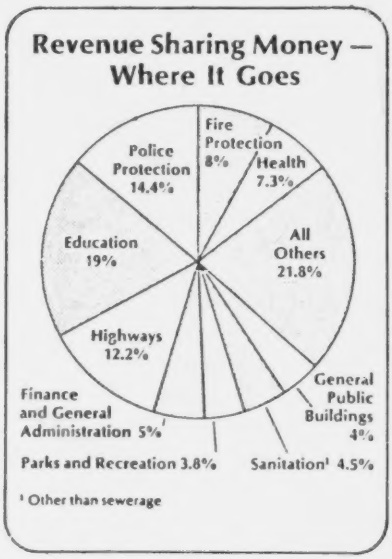
Between the time it was enacted in 1972 and September 1980, the federal revenue sharing program has provided over $55 billion to state and local governments. Of this amount, one-third has accrued to the states and the remaining two-thirds to over 39,000 local governments. The total impact of federal categorical aid and non-categorical aid on state budgets in the Mid-South is enormous. In fiscal year 1977, Mississippi received $578.8 million in federal dollars, Arkansas received $461.3 million, and Tennessee received $817.4 million. These amounts represented about 42.0 percent, 43.0 percent, and 34.0 percent of the total revenue that these states raised from their own tax sources in 1977.[1]

Until revenue sharing was enacted, federal grants to the states were largely of a categorical nature. Categorical grants usually involve stringent rules that govern who is eligible for a program and how the funds should be dispersed. Such grants are common in the environmental, human resources, and transportation areas. Indeed, recent estimates by the Advisory Commission on Intergovernmental Relations (ACIR) indicate that almost 500 different federal aid programs currently exist for state and local governments. Some state and local governments fail to take advantage of these programs due to stringent eligibility requirements, lack of awareness of the existence of the programs, or inadequate resources to provide the matching funds which the federal government requires. The states also complain that to obtain federal funds, they must engage in activities federal legislators place priority on, rather than in activities which are important at a regional or local level. The criticism is also made that this proliferation of categorical aid programs also increases the costs of administration.

Federal revenue sharing is an unconditional aid program which involves the collection of taxes at the federal level and their disbursement, largely without restriction as to use, to state and local governments. This program is preferred by non-federal governments because it provides supplemental funds which can be used to meet local and regional needs. While federal laws on civil rights, audit procedures, and program accounting are applied, substantial latitude is granted to the recipient governments on how these funds should be spent. Thus, the areas of greatest priority are determined at a more decentralized level.

Figure 1 shows how revenue sharing funds were spent by state and local governments in fiscal year 1976-77 according to the U. S. Treasury Department. However, this does not tell the whole story, since some states have used their revenue sharing funds to reduce taxes or to stave off tax increases. Note that a substantial portion of these funds is spent on three functions: education (primarily elementary and secondary schools), police protection, and highways.

Figure 1



Source: "States Face Uphill Battle in Revenue Sharing Debate," *Congressional Quarterly*, February 23, 1980, p. 531.

Throughout our nation's history, conditional grants have provided a larger share of revenue for non-federal governments than have unconditional grants. In fiscal year 1975, for example, conditional grants represented 88.0 percent of total federal aid to other levels of government.[2] In part, this is due to the extensive use of bloc grants which specify that funds be used for a specific function, but which also allow some latitude in the ways in

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[1]Tax Foundation, *Facts and Figures on Government Finance 20th Biennial Edition, 1979* (Washington, D.C.: The Tax Foundation, 1979), p. 180.

[2]Bernard Herber, *Modern Public Finance* (Illinois: Richard D. Irwin, Inc., 1979), p. 348.

which program goals can be achieved. Bloc grants in the employment, economic and community development, and mass transportation areas have grown substantially during the last decade. Yet, both state and local governments prefer the flexibility and simplicity of the general revenue sharing program.

At the moment, the future of the state share of general revenue sharing is in doubt. In part, this is a reflection of increasing pressures on the federal budget; in part, too, it is a reflection of the changing attitudes toward what the needs of the states [illegible] federal aid to the states is reduced, this will have a substantial effect on the budgets of state governments and, at least in some, severe cutbacks can be expected. To understand the issues and the implications of the debate, it is useful to briefly explore the origins of general revenue sharing.

Origins of General Revenue Sharing

The idea that the federal government, because of its strong position, should support the states is not a new one. An excursion into the financial history of the U. S. reveals that the earliest example of a program of cash payments from the federal to the state fisc occurred in the 1830s. At that time, the West was growing rapidly, and the states were faced with huge demands for funds to both improve existing transportation facilities (e.g., roads, barge canals) and to create access routes into the newly developing areas. Between 1820 and 1838, the states borrowed $60 million for canal construction, $53 million to capitalize state banks, $43 million for railroads, and $7 million for turnpikes. Smaller amounts were borrowed for state universities, hospitals, statehouses, schools, and jails.[3] The need to pay principal and amortization on this debt placed a strain on state revenues. To the chagrin of many state legislators, however, the amounts collected from property taxes, excises, lotteries, and investments were limited.[4]

In contrast to the situation in the states, the federal government was running a considerable surplus. This grew from $8.1 million in 1829 to $14.6 million in 1833 to $19.9 million in 1836. Efforts to eliminate the surplus through a federal program of improvements failed to satisfy the population of the growing areas and led to pressure for more state-initiated projects. But the administration rejected this proposal. Instead, Secretary of the Treasury Woodburn proposed the development of a federal fund which would store the surplus as a means to meet future contingencies. His initiative was blocked by the Congress, which demanded and eventually got the President to acquiesce to a proposal that gave the surplus to the states to help finance internal improvements.

In 1836, an agreement was worked out to distribute all but $5 million of the surplus to the states, the amount received by a state to be based on its proportionate representation in the House and Senate. By January 1837, the available surplus was $37.5 million (then a sizeable sum), and this was to be paid to the states in four installments. The last payment was never made because in October 1837 a panic broke out, severely curtailing economic activity and causing the federal surplus to vanish. But the principle of revenue sharing had been established.

Viewed through the veils of history, this early experiment with revenue sharing had several similarities to the events of the 1960s and 1970s. The debate to authorize revenue sharing was lively and intense, concerns were expressed about irresponsible use of funds, and it took several years to work these problems out. The program also proved to be of relatively short duration, but it established the feasibility, if not the desirability, of such transfers.

Origins of the Current Program

The current revenue sharing program had its origins in the early sixties. President Kennedy, in office barely a year, faced an economy which, although only recently out of the 1958-59 recession, had begun to turn downward. Headed by Walter Heller, the President's Council of Economic Advisors reached the conclusion that growth of the economy was impeded by the fiscal drag which the tax structure exerted on the economy. The Council's solution was to reduce tax rates to bring the economy up to its full employment level. However, at that level the government was expected to be running a surplus, and once again the issue arose as to what to do about this. In 1964, a special economic task force suggested to President Johnson that a general revenue sharing program be adopted. Several additional proposals were made to Congress, including a 1969 proposal by President Nixon.

Despite the initial enthusiasm which greeted the program, two presidents and half a decade passed before revenue sharing was enacted. As the linch pin of President Nixon's program for strengthening the relative role of the states, revenue sharing gained sufficient support to pass a Congressional vote. The State and Local Fiscal Assistance Act of 1972 emerged as an experiment in what President Nixon called "the New Federalism," and the first checks were sent to state and local governments on December 8th of that year.

The new program was not without its powerful critics. Wilbur Mills, Chairman of the House Ways and Means Committee, told the Arkansas legislature that "he hoped that the program would not last beyond its allotted five years." Likewise, Senate Majority Leader Mansfield argued in a newspaper article that the program was not working and was not likely to work in the future, and Senator Adlai Stevenson III warned states and localities not to become overly dependent on revenue sharing.[5] Despite these critics, the Congress appropriated $5.3 billion in funds between January and December 1972 and provided for a reauthorization of the general revenue sharing program in 1976.

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[3]Paul Studenski and Herman E. Kroos, *Financial History of the United States* (New York: McGraw-Hill, 1950), p. 102.

[4]Ibid., p. 101.

[5]Richard P. Nathan and Charles F. Adams, Jr., *Revenue Sharing: The Second Round* (Washington, D.C.: The Brookings Institution, 1977), pp. 1-2.

Enacted to provide funds to the states to *supplement* their other programs, revenue sharing soon came under fire because the Nixon budget for fiscal 1974 reflected sharp *cuts* in categorical aid to the states. Walter Heller reflected the surprise and disappointment of many of the program's supporters when he wrote that "the birth of revenue sharing is being used to justify the homicide of selected social programs."[6] Shortly thereafter, the Nixon administration increased its efforts on behalf of the program, and many state and local officials testified about its benefits. For example, Moon Landrieu, then Mayor of New Orleans and currently Secretary of the Department of Housing and Urban Development, spoke of the "devastating" effects of terminating the program. Many other officials stressed the likely reduction in state and local programs which would accompany the elimination of revenue sharing funds.

The tumultuous six years between 1973 and 1979 resembled the trench warfare of World War I. Revenue sharing was modified to insure civil rights compliance, to strengthen audit procedures, to require payment of prevailing wages, and to alter the formula by which funds were distributed. In addition, a new countercyclical aid program was introduced to provide federal aid to combat the financial exigencies created by recession. By the summer of 1979, the Advisory Commission on Intergovernmental Relations (ACIR) concluded that "no other major federal aid mechanism engendered such cohesive state-local support."[7] But the state share was increasingly under attack at the national level. Helped by changes in the tax structure and by changing national priorities, the opponents of revenue sharing began to find increased support for their position.

The Perils of Pauline

The subsequent history of revenue sharing reads like a chapter from *The Perils of Pauline*. In April 1979, the House Budget Committee approved a resolution which eliminated the state share ($2.3 billion) of revenue sharing funds from the 1980 budget, and the full House approved the resolution. In June, the House passed an appropriations bill with the state share included, and in July the Senate Appropriations Committee again called for a reduction—this time of $684 million. Three days later, the Senate rejected the Appropriations Committee proposal and in August its Budget Committee called for a 60.0 percent reduction in the states' 1981 share.

In early 1980, the Carter administration, in an attempt to shift policy toward budget restraint, recommended that the states be excluded from revenue sharing for fiscal 1982 and 1983. Shortly thereafter, it reversed itself. The House Government Operations Subcommittee on Intergovernmental Relations then decided to exclude the states in fiscal year 1981, but put them back in fiscal years 1982 and 1983. On June 24th, it also reversed itself and removed the state share. But when the full Government Operations Committee met in July, it reinstated the state share. As matters now stand, the state share has again been eliminated, while general revenue sharing for local governments has been extended through 1983.[8]

The election of Ronald Reagan is likely to strengthen the role of the states, but whether revenue sharing will be the financing vehicle for the new administration remains to be seen. Remarks made by the President-Elect during his campaign suggest that he will attempt to return a number of public programs to the states. Most likely is the possibility of financing through an increase in bloc grants, since this would preserve a modicum of federal control. An alternative possibility is that Reagan would specifically earmark a portion of revenues from the individual or corporate income tax for state use. In light of the recent strong opposition to state revenue sharing, it is unlikely that Congress will easily agree to an expansion of this program as preferable to a categorical or bloc grant approach.

The Changing Fiscal Situation

To understand this remarkable tug-of-war it is helpful to identify the underlying economic forces which work against continued revenue sharing with the states. Prime among these forces are the changing position of the federal sector and the strengthened finances of the states.

At the federal level strong pressures have developed to hold down expenditures and to bring the budget closer to balance. Federal budget outlays were estimated in the President's budget at almost 23.0 percent of the nation's GNP.[9] In other words, almost one quarter of the total goods and services produced in the U.S. were either consumed directly by the federal government or transferred back to consumers through income distribution programs. Many more dollars were directed toward governmentally determined purposes by government regulations. With the exception of 1976, the federal share of GNP was at its highest level since the late forties. At the same time, the federal budget showed a deficit for every year during the seventies and was projected to be in deficit through fiscal years 1980 to 1982. Under these circumstances, careful pruning of the budget was inevitable.

In contrast, the fiscal position of the states had improved between 1960 and 1980. The prime improvement was the development of more balanced revenue sources than had existed in the past. For example, 37 states had both a personal income tax and a sales tax in 1980 compared with 19 states in 1960. In 1960, for all states, combined revenues exceeded expenditures by $1.2 billion. By 1970, the surplus had risen to $3.8 billion.[10]

In reality, these aggregates masked differences between

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[6]Ibid., p. 2.

[7]Will Meyers and John Shannon, "Revenue Sharing for the States: An Endangered Species," *Intergovernmental Perspective*, Summer, 1979, p. 10.

[8]At the time this article went to the printer, the Senate had not yet met with the House to work out a compromise on this and several other appropriation bills.

[9]*Budget in Brief, FY 1980-81* (Washington, D.C.: United States Government Printing Office, January, 1980), p. 81.

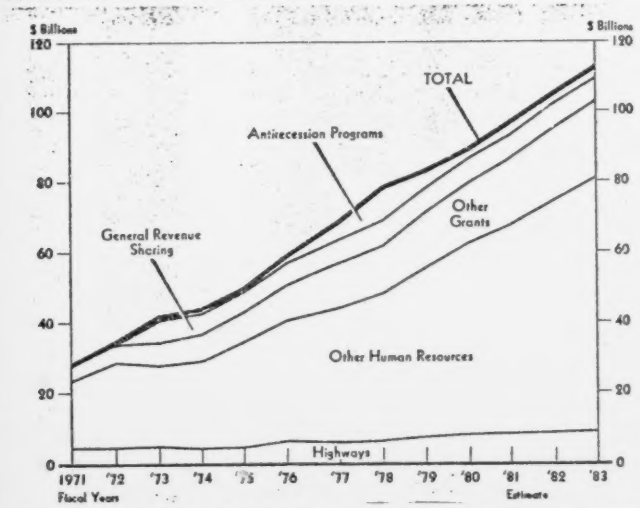
[10]Tax Foundation, p. 166.

hard-pressed states like Massachusetts and New York and those with comfortable surpluses like California. Nonetheless, opponents of revenue sharing questioned the need for continued aid when it meant the federal government must borrow funds at high interest rates so the states could sequester them in working capital or rainy-day funds or use them to reduce tax rates. Particularly galling to the federal establishment was the fact that some state politicians criticized national politicians for failing to provide tax reductions or balanced budgets at the national level while using revenue sharing funds to buy goodwill through tax reduction. If reductions were to be made, the feds preferred to get the credit themselves.

In addition, opponents of further extension of revenue sharing believed the federal government had helped the states enough. Federal aid to state and local governments grew at a rapid pace (15.0 percent annually) during the past quarter century. In 1955, federal aid payments to state and local governments were $3.2 billion. By 1960, they had more than doubled to $7 billion; and by 1970, they had increased threefold to $24 billion. By 1980, federal aid had tripled again to almost $83 billion.[11] Viewed against this backdrop, opponents of revenue sharing believed they had reason to argue that limits should be placed on state aid. Figure 2 presents the different forms of aid from the federal government and how they have grown through time.

Figure 2

Federal Grants to State and Local Governments



Source: *U.S. Budget in Brief, Fiscal Year 1980-81* (Washington, D.C.: U.S. Government Printing Office, January, 1980).

Finally, the argument was advanced that, if its goal is to reduce the proliferation of individual grant programs, the revenue sharing program must be judged a failure. At the time of the program's enactment, some 200 separate aid programs existed. This placed a strain on the states which found it necessary to keep track of the proliferating aid programs with their multiple eligibility requirements and distributional aid formulae. Revenue sharing notwithstanding, the number of federal aid programs continued to grow to almost 500 by 1980, reflecting a Congressional desire to retain control on the type and shape of domestic spending programs.

On the other hand, revenue sharing proved that federal aid programs could be run at low effort and with minimal federal staffing; President Nixon's "New Federalism" could work. In the words of Senator Moynihan of New York, ". . . revenue sharing is simple, it is easy to understand, its benefits are direct, and it has created no bureaucracy. There is no bureau of revenue sharing. It is very small. It takes up about 5% of the time of an assistant secretary of the Treasury who does it beautifully."[12] Moynihan went on to extol the virtues of the program as "one of the really fine pieces of intergovernmental exchange machinery we have created."

Despite the accolades, the state portion of revenue sharing seems destined to encounter further obstacles. Remilitarization of the U.S., a major issue in the presidential campaign, is likely to swallow several billion federal dollars. Most of these dollars will be obtained by cuts in domestic programs. Likewise, serious reindustrialization of the economy will involve tax reductions of an order of magnitude sufficient to provide for replenishment of the industrial base. An almost inevitable consequence will be the pruning of domestic programs, the most politically vulnerable of which are likely to be drastically cut back.

Short-Run Implications for State Government

Elimination of revenue sharing is likely to have an uneven effect on the states. Those which have accumulated surplus revenues will probably experience only mild distress, while states with high taxes and large expenditure needs are likely to be hard pressed to balance their budgets. Several measures of "fiscal stress" are available to compare the differing abilities to pay and needs of the states. Such measures attempt to capture tax capacity and to relate actual taxes to taxable capacity to see how pressed taxpayers are. Several measures also are available to quantify the needs which states face. Together, these measures indicate which states are experiencing the greatest fiscal stress. Among these are New York, Massachusetts, Hawaii, California, Rhode Island, Maine, Vermont, and Pennsylvania.[13] In contrast, at the low end of the stress scale are Wyoming, Alaska, Nevada, Texas, North Dakota, and Florida. All of the states in the Mid-South lie below the national average; all of those in New England lie above.

While serious criticisms can be levelled at any indicator of "stress," the fact remains that the states are a disparate

[11]Advisory Commission on Intergovernmental Relations, *Significant Features of Fiscal Federalism, 1978-79 Edition* (Washington, D.C., May, 1979), p. 3.

[12]Meyers and Shannon, pp. 13-14.

[13]It is ironic, but true, that California can run a surplus yet feel fiscal stress at the same time.

lot and that elimination of the state share will remove a key mechanism for alleviating fiscal stress. An almost inevitable result of the elimination of revenue sharing is that those states in distress will either have to raise taxes to cover the rising costs of their programs or else cut programs. The former is more likely than the latter.

The short-run consequences for states below the national average (such as Tennessee) are less obvious. In comparison with the hard pressed states, the low stress states have a greater potential tax base they can rely on *if* they choose to raise revenues to offset the loss of federal revenue sharing funds. However, the pressure to limit or lower taxes is strong in many of these states. According to the National Taxpayer's Union, petitions to limit taxes were circulated in nine states in 1980. Of these, two are at the bottom of the stress scale (Alaska and Nevada), and two more are below the national average. A reluctance to raise taxes is prevalent in many other states. For those low stress states which decide against tax increases, the loss of revenue sharing funds is likely to mean cutbacks in public programs. If past experience is a guide, these cuts will probably be distributed across a large number of programs, although big ticket items like education are likely to feel the pressure more intensely than the smaller programs. Programs which involve matching funds are likely to take proportionally smaller cuts.

For most states, elimination of revenue sharing will make their revenues more vulnerable to economic downturns due to the fact that revenue sharing funds were a stable item which accrued to the states each year irrespective of the health of the economy. Their elimination removes a guaranteed source of revenue from the state fisc. Especially for those states which rely on income taxation, revenues will be less stable because incomes fall in bad years and rise in good ones. A consequence seems to be that state planners will find it necessary to build greater reserves against a decline in revenue. This will require the accumulation of surplus funds either through additional budget cuts or tax increases.

State Governments in the Long-Run

Despite these problems, the states face the eighties in a stronger position than they have been in during the last two decades, particularly in relation to local governments. In 1963, the states raised about $1 for each $1 raised by local governments. By 1979, they collected over $1.40 for each $1 of local revenue.[14] Moreover, the use of an income tax by 37 states has provided a large revenue source which should cause state revenues to rebound and grow during periods of economic growth. In the absence of major new demands on states for new programs, their long-term position appears secure.

In the last two decades, many state and local governments have taken action to reduce the regressivity of their tax structures. Particularly noteworthy is the fact that more than half the states with sales taxes exempt basic necessities such as food and drugs from taxation. In addition, 29 states have enacted legislation designed to protect property owners from unduly harsh property taxes. Aimed mainly at low income households, these provisions help to shield those at the bottom of the income distribution sector from paying too large a portion of their income in taxes. Since most states employ regressive tax structures to raise revenues, the effect of their changes is to lessen the burden imposed by state and local governments.

Preliminary indications are that demands on state and local governments to solve the pressing problems will continue to grow. Particularly in the environmental resources area, the problems remain regional in nature and amenable to solution at the statewide or multi-state level. The vast educational establishment continues to consume a large portion of state budgets, and decisions by the courts will inexorably lead to growth in the share of elementary and secondary finances paid by the states. While the great road building programs of the sixties are largely over, the states face new demands for mass transit systems and for other facilities designed to lessen reliance on imported oil. And each year Congress adds new categorical aid programs designed to entice the states into ever-increasing activities.

More problematic is the question of how the elimination of the state share will affect the future of local revenue sharing. At present, the program for providing funds to localities has been extended for an additional three years. At current funding levels, this would provide almost $14 billion to local governments. Even in the absence of payments directly to the states, this should aid their fiscal situation since it eases the pressure on local governments and reduces the need for state funding. But if the federal fiscal picture continues to dim, cuts in the local revenue sharing program may be forthcoming.

Whether this will eventually happen is difficult to forecast. Local governments have made many friends on Capitol Hill, and their lobbying organization is fairly powerful. Nonetheless, if the President should decide on significant tax reductions in the next few years, the localities would probably be affected. This would place additional demands on the state fisc.

Many of these are not new problems for the states, and there is evidence that some upgrading of budgetary procedures and personnel to meet these needs has occurred. Nonetheless, the nation is entering an era of increasing competition for scarce financial resources. With capital stock aging, defense needs growing, and the nation's taxpayers increasingly resentful of the large chunk of income coming out of their pockets to finance the public sector, the states either will have to make a better case for new or increased taxes than they did in the seventies or be content with what they have. The last chapter in the wild and exciting life of Pauline has yet to be written.

[14]Advisory Commission on Intergovernmental Relations, p. 3.

THE SOVIET COTTON INDUSTRY IN THE 1980s: A TROUBLED DECADE

*Francis M. Stackenwalt**

This is the first report in a series of investigations of current economic and social trends in the Soviet Union being undertaken by the Memphis State University Center for Manpower Studies. In the future, Soviet manpower, the consumer industry, foreign trade and investment opportunities, and agriculture will be scrutinized. Each research topic will focus tightly upon facets of these broad categories which have particular relevance to the Mid-South. The methodology will be to scour the journals and monographs of Soviet ministries and academies of sciences and the newspapers of the national and regional presses; the goal will be to test with empirical evidence already hypothesized generalizations and to advance, on the basis of the findings, new suppositions. Since American analysts have ignored far too long the Soviet cotton industry, and since cotton symbolizes both the uniqueness and universality of the continuing economic transformation of the Mid-South, cotton seemed the most appropriate inaugural topic for this project.

Cotton growing has an ancient history in what is now Kazakhstan and Soviet Central Asia.[1] Some time during the latter centuries of the pre-Christian millennium, cotton was brought from India or Persia to the khanates straddling the Syr-Daria and Amu-Daria rivers. After the Russian conquest of the khanates in the last half of the nineteenth century, Central Asian cotton became a prime factor in the industrial evolution of the tsar's empire. Today, the Soviet Union is a major cotton producing nation, harvesting 20.0 percent of the world's total cotton in 1979. With the exception of 1972-73 and 1979, Russia held first place in cotton production in the seventies.

However, while the Soviets usually produce more cotton annually than do the Americans, there is a marked difference in the overall quality of the harvest and in the use of technology. The ratio of long-staple cotton varieties to gross cotton production in the Soviet Union is below that of the United States. More critically, the Russian industry is still a labor-intensive, relatively technologically backward enterprise in comparison to the American industry. Cotton growing in the USSR is situated in a geographical region that has only recently felt the effects of industrialization and scientific agriculture. It is the thesis of this article that the key to the further expansion of cotton production in the Soviet Union lies in the further modernization of Kazakhstan and the Central Asian republics of Kirgiziia, Tadzhikistan, Turkmenistan, and Uzbekistan. The Azerbaidzhanian SSR, which is separated from the Soviet cotton belt by the Caspian Sea, is the only other Soviet republic with a sufficiently long frost-free season to make the area a large producer. However, the continued development of the area's cotton sector is intertwined with that of Central Asia, the chief producing region.

Table 1

COTTON ACREAGE, YIELDS PER HECTARE, AND PRODUCTION IN THE USSR, USA, AND WORLD FOR 1979

	Acreage (in Thous. Ha.)	Yields (kg/ha)	Production (in Thous. Metric Tons)
USA	5,247	606	6,633.4
USSR	3,087	925	5,955.5
World	32,142	442	29,659.2

Source: U. S. Department of Agriculture, Foreign Agriculture Circular, *Cotton*, April, 1980, p. 15.

Table 2

PRODUCTION OF COTTON BY TERRITORIAL UNITS: 1976—1978 (in Thous. Metric Tons)

Unit	1976	1977	1978
Uzbek SSR	5,335	5,676	5,500
Turkmen SSR	1,046	1,170	1,027
Tadzhik SSR	847	861	909
Azerbaidzhan SSR	532	512	598
Kazakh SSR	310	324	260
Kirgiz SSR	208	215	205
USSR	8,278	8,762	8,499

Source: *Narodnoe khoziaistvo SSSR v 1978g.*, 224.

This article ventures a few thoughts on the prospects for the continued scientific and economic rationalization

**Assistant Professor of History, Memphis State University.* *The author expresses gratitude to Professor John Gnuschke, Director, Center for Manpower Studies, Memphis State University, for his generous assistance in acquiring source materials on the Soviet Union. Special appreciation is also extended to the Russian and East European Center, University of Illinois, Urbana-Champaign, and the Special Languages Department, Illinois Main Library, for making available their magnificent Soviet collection.*

[1]The four Soviet Central Asian republics are the Kirgiz SSR, Tadzhik SSR, Turkmen SSR, and Uzbek SSR. They are bounded in the west by the Caspian Sea, in the north by Kazakhstan, in the east by China, and in the south by Iran and Afghanistan.

MID-SOUTH ECONOMY

BUREAU OF BUSINESS & ECONOMIC RESEARCH THE FOGELMAN COLLEGE OF BUSINESS AND ECONOMICS MEMPHIS STATE UNIVERSITY

STATISTICAL SUPPLEMENT

MID-SOUTH ECONOMY

The fourth quarter of 1980 was a period of slow or no growth in the Mid-South states. Personal income in the five-state Mid-South region in September increased at a higher rate than that of the nation. Arkansas was the only state with growth below the 11.1 percent increase in the U.S.

Sales tax collections in one month are an indicator of retail sales in the prior month. Collections in November in Alabama failed to reach the level of those in the same month in 1979, and the year-to-date total was only 1.8 percent higher. Arkansas' November collections were 4.7 percent higher than those a year earlier, but the January-November collections increased 10.9 percent. Louisiana outperformed the other states with collections that increased 13.5 percent during October and were up slightly over the 1979 year-to-date total. Mississippi sales tax collections for the latest month were up 12.7 percent, with a January-October increase of 8.7 percent. Tennessee had only a 5.7 percent increase in the latest month and a 2.9 percent increase for the year-to-date. For the states that rely heavily on sales tax revenues, the low growth in collections means trouble in state financing.

Civilian Labor Force and Unemployemnt

Growth of 1.5 percent in the national civilian labor force in 1980 was much less than the 2.5 percent growth rate in the 1970s when baby boom babies and women entered the labor force in large numbers. A failure to absorb the growth in the labor force plus losses in manufacturing and construction caused the unemployment rate to rise from 5.6 percent in November 1979 to 7.1 percent in November 1980. Alabama had the lowest growth rate, 0.7 percent, in the civilian labor force in the region but the highest unemployment rate, 8.7 percent. Arkansas' civilian labor force increased 1.9 percent over the year, and unemployment rose from 5.3 percent to 7.3 percent. In spite of a high growth rate (3.2 percent) in the labor force in Louisiana, the unemployment rate declined slightly—from 6.3 percent to 6.2 percent. Mississippi had the regional high growth rate of 3.7 percent in the civilian labor force, and its unemployment rate rose over the year from 5.3 percent to match the national rate of 7.1 percent. Tennessee had a growth rate of 2.0 percent in the civilian labor force. Unemployment increased from 5.2 percent in 1979 to 6.9 percent in 1980.

Non-Agricultural Employment

Manufacturing job losses have contributed heavily to higher unemployment. Non-manufacturing employment gains, however, have more than offset the manufacturing losses in the nation. In the Mid-South, only Louisiana had a large enough increase in non-manufacturing employment (4.0 percent) to offset a small decline (0.2 percent) in manufacturing employment. Louisiana also had the smallest proportion of manufacturing workers in non-agricultural wage and salary employment. Manufacturing job losses in the nation in 1980 were 3.4 percent from a year ago. The regional states, except Louisiana, had declines in manufacturing employment of 4.1 percent in Arkansas, 4.7 percent in Tennessee, 4.8 percent in Alabama, and 6.1 percent in Mississippi. Non-manufacturing employment gained 1.5 percent in the United States, while Alabama, Mississippi, and Tennessee had losses.

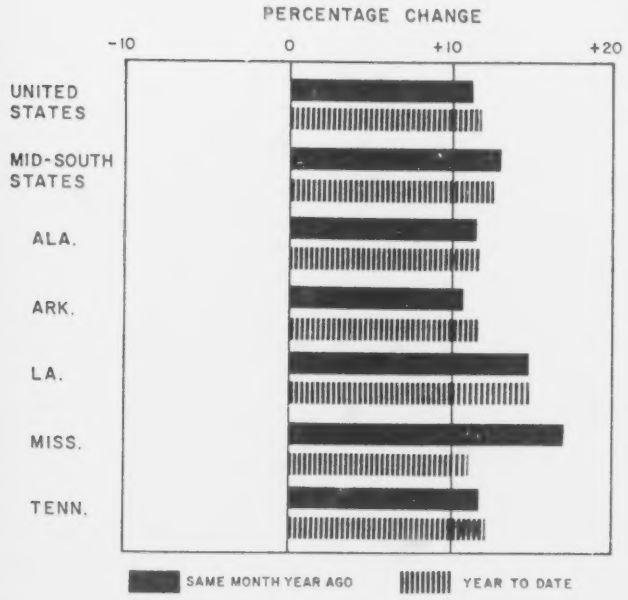
Earnings

Average weekly earnings of production workers in manufacturing in the nation in 1980 were $302.80. This figure was 9.4 percent higher than a year ago. Louisiana, with the highest average weekly earnings, also had the highest regional increase, 12.4 percent. Mississippi had the lowest average earnings of the regional states, but its 10.1 percent increase still exceeded the national rate. Alabama, Arkansas, and Tennessee had increases in average weekly earnings of 7.5 percent, 8.9 percent, and 8.6 percent, respectively.

Construction

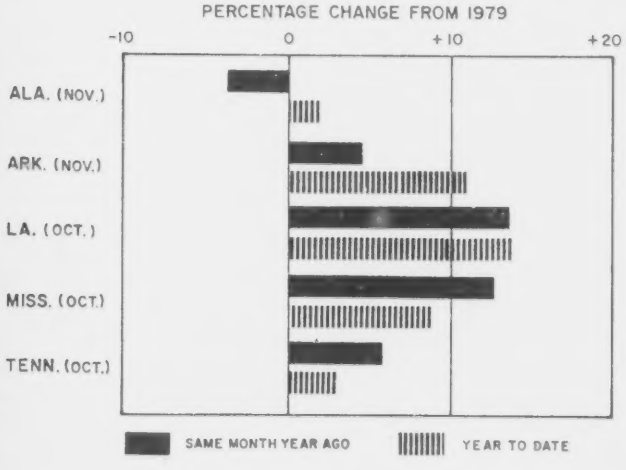
Total construction contracts awarded in the nation increased 13.3 percent in November, but the year-to-date total was still 14.8 percent below the same period in 1979. Two of the four states for which data are available had large increases for the month which helped offset the year-to-date declines. Louisiana's November awards increased 53.4 percent, which brought the eleven-month total to 7.9 percent below the same period in 1979. Mississippi's total

PERSONAL INCOME - SEPT., 1980

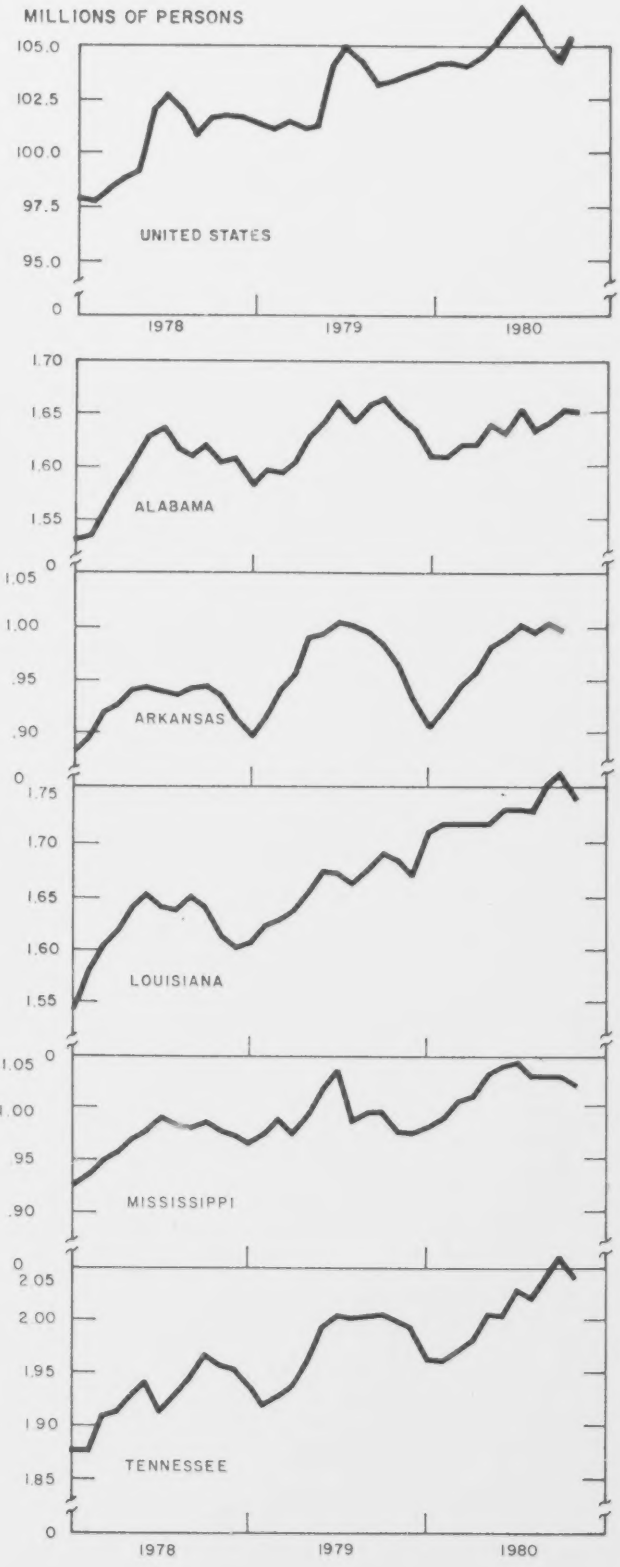


SOURCE BUSINESS WEEK, FEB. 2, 1981

SALES TAX COLLECTIONS 1980



CIVILIAN LABOR FORCE



LABOR 1980	United States (November)	Mid-South States				
		Alabama (November)	Arkansas (October)	Louisiana (November)	Mississippi (November)	Tennessee (October)
Civilian Labor Force	105,287,000	1,649,600	999,000	1,743,900	1,022,500	2,058,000
Percent Change Year Ago	+ 1.5	+ 0.7	+ 1.9	+ 3.2	+ 3.7	+ 2.0
Unemployed	7,486,000	144,000	72,500	107,300	72,600	142,900
Percent Change Year Ago	+29.6	+27.0	+38.4	+ 1.3	+39.3	+35.6
Unemployment Rate						
1980	7.1	8.7	7.3	6.2	7.1	6.9
1979	5.6	6.9	5.3	6.3	5.3	5.2
Non-Agricultural Wage & Salary Employees	90,880,000*	1,348,400	760,100	1,576,500	831,900	1,774,600
Percent Change Year Ago	+ 0.4	- 2.1	- 0.7	+ 3.4	- 2.0	- 2.2
Manufacturing Employment	20,243,000*	355,900	209,900	216,100	220,000	509,800
Percent Change Year Ago	- 3.4	- 4.8	- 4.1	- 0.2	- 6.1	- 4.7
Non-Manufacturing Employment	70,637,000*	992,500	550,200	1,360,400	611,900	1,264,800
Percent Change Year Ago	+ 1.5	- 1.2	+ 0.6	+ 4.0	- 0.5	- 1.1
Average Weekly Earnings of Production Workers in Manufacturing	$302.80	$270.14	$232.85	$337.35	$223.91	$247.56
Percent Change Year Ago	+ 9.4	+ 7.5	+ 8.9	+12.4	+10.1	+ 8.6
Average Weekly Hours of Production Workers in Manufacturing	40.0	40.5	39.4	41.7	39.7	39.8
Percent Change Year Ago	- 0.7	- 1.2	- 1.7	- 0.5	- 1.0	-0.5
Average Hourly Earnings of Production Workers in Manufacturing	$7.57	$6.67	$5.91	$8.09	$5.64	$6.22
Percent Change Year Ago	+10.2	+ 8.8	+10.9	+13.0	+11.2	+ 9.1

*Seasonally Adjusted.

Source: Departments of Employment Security.

CONSTRUCTION 1980 November	United States	Mid-South States	Ala.	Ark.	La.	Miss.	Tenn.	West Tenn.
Value of Construction Contracts Awarded								
Total Construction								
Percent Change Year Ago	+13.3	+ 61.7	NA	- 3.6	+ 53.4	+417.0	- 7.6	-26.1
Percent Change Year-to-Date	-14.8	- 39.2	NA	-25.3	- 7.9	- 63.0	-46.4	- 7.5
Total Building								-
Percent Change Year Ago	+28.7	+ 87.0	NA	-12.7	+ 95.2	+504.8	- 0.9	-25.0
Percent Change Year-to-Date	-10.0	- 9.5	NA	-15.7	- 14.3	+ 21.1	-13.4	- 8.5
Residential Building								
Percent Change Year Ago	+24.3	+ 43.3	NA	+ 5.0	+ 53.2	+ 65.9	+49.3	+27.9
Percent Change Year-to-Date	-18.1	- 13.6	NA	-16.5	- 13.7	- 8.5	-14.2	- 6.0
Non-Residential Building								
Percent Change Year Ago	+34.2	+124.1	NA	-31.8	+159.7	+962.8	-26.1	-38.1
Percent Change Year-to-Date	+ 2.2	- 4.4	NA	-14.1	- 14.9	+ 79.7	-12.4	-11.0
Public Works and Utilities								
Percent Change Year Ago	-25.9	- 9.5	NA	+18.6	- 12.2	+ 24.3	-38.1	-39.7
Percent Change Year-to-Date	-28.5	- 70.6	NA	-48.7	+ 13.7	- 89.6	-78.3	- 1.9
Total Dwelling Unit Starts to Date	1,202,300	75,142	NA	13,803	21,832	13,770	25,737	6,594
Percent Change Year Ago	-27.4	- 23.8	NA	-24.9	- 28.3	- 19.6	-21.2	-16.9

Source: F. W. Dodge Reports and Survey of Current Business.

construction awards in November were 417.0 percent above November 1979, but the year-to-date total was still 63.0 percent lower than for the same period last year. Arkansas and Tennessee had losses for the month of 3.6 percent and 7.6 percent, respectively.

Residential building contracts awarded in November were up from November 1979 in the four regional states, with awards in Louisiana, Mississippi, and Tennessee increasing more than twice the U.S. increase of 24.3 percent. Residential awards in the nation for the January-November period were down 18.1 percent from the same period in 1979. All the Mid-South states had year-to-date losses in residential construction, ranging from 8.5 percent in Mississippi to 16.5 percent in Arkansas, but these losses were still less than the decline in the nation.

Total dwelling unit starts to-date declined 27.4 percent in the nation compared with a 23.8 percent decline in the region. Losses in starts varied from 19.6 percent in Mississippi to 28.3 percent in Louisiana.

Non-residential building awards increased 34.2 percent in the U.S. in November, bringing the year-to-date total increase to 2.2 percent. Louisiana and Mississippi had increases for the month, but only Mississippi had a gain during the January-November period. Public works and utilities construction contract awards in the nation declined 25.9 percent in November from the same month

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in 1979. Arkansas and Mississippi had increases for the month, but Tennessee had a greater decline than the nation. Louisiana was the only regional state which had an increase in the year-to-date total.

Finance

During the latest month for which data are available, figures from the Federal Home Loan Banks showed a positive net savings flow in the region as a whole, although the rate in Alabama was below last year's level. However, the 1980 year-to-date total was lower than the comparable 1979 total in Arkansas and Alabama. Mortgage loans for the month fell below a year ago in Arkansas, Mississippi, and Tennessee, while the year-to-date totals were lower in all the regional states.

Financial data of member banks of the Federal Reserve System are only available for District 8, which covers West Tennessee, North Mississippi, and Arkansas. In those banks, total loans increased 1.5 percent in Arkansas and 0.7 percent in North Mississippi, while decreasing 3.0 percent in West Tennessee. While total deposits were up from the same period last year in the region, the 6.6 percent increase in North Mississippi member banks was the only increase which matched that of all domestically chartered banks.

FINANCE 1980	United States[1]	Mid-South States District 8 Only	Alabama District 6	Arkansas District 8	Louisiana District 5 Only	Mississippi District 8 Only	Tennessee District 8 Only
Member Banks as of 10/29/80 Percent Change from Comparable Date 1979							
Total Loans	+ 5.6	- 0.2	NA	+ 1.5	NA	+ 0.7	- 3.0
Total Deposits	+ 6.6	+ 4.4		+ 5.0		+ 6.6	+ 3.0
Net Demand Deposits	- 0.1	- 8.5		- 7.0		- 6.1	-11.4
Time Deposits	+10.5	+13.1		+13.6		+13.5	+12.4

[1]United States data are for all domestically chartered commercial banks except for branches of foreign banks.

Source: Federal Reserve Board of Governors and the Federal Reserve Board of St. Louis.

SAVINGS AND LOAN ACTIVITY 1980	Alabama (October)	Arkansas (November)	Louisiana (November)	Mississippi (November)	Tennessee (November)
Mortgage Loans Made (millions)	$56.0	$ 41.6	$110.9	$24.4	$50.7
Percent Change Year Ago	+16.2	- 7.8	+ 13.6	-25.2	- 8.9
Percent Change Year-to-Date	-28.2	- 19.4	- 8.2	-31.9	-26.3
Net Savings Flow (millions)	$21.7	$ 24.5	$ 53.1	$16.2	$1*.8
Percent Change Year Ago	-31.3	+389.0	+ 76.8	+76.8	...[a]
Percent Change Year-to-Date	-10.8	- 42.8	+ 26.3	+25.5	+53.5

[a]Cannot measure as in 1979 there was an outflow of funds.

Source: Federal Home Loan Banks of Little Rock, Cincinnati, and Atlanta.

THE TENNESSEE ECONOMY

The Tennessee economy improved slightly from the third quarter, although most indicators have not rebounded to the level of a year ago.

The civilian labor force was 2,058,000 in October, up 2.0 percent from the year before. The unemployment rate of 6.9 percent was unchanged from September, but was up from 5.2 percent during the same period last year. Average weekly earnings of production workers in manufacturing were $247.56, an increase of 8.6 percent compared with 9.4 percent in the nation. Because of the decrease in hours worked, there was a slightly larger increase in average hourly pay than in weekly-earnings.

Non-agricultural wage and salary employment of 1,774,600 workers was 2.2 percent below October 1979. This decline was the largest in the region. The loss in manufacturing employment in Tennessee of 4.7 percent was greater than the 3.4 percent decrease in the nation. Non-manufacturing employment lost 1.1 percent in the state compared with a 1.5 percent increase in the nation. The heaviest losses were in trade, 17,400 jobs, 4.4 percent, and in construction, 9,900 jobs, 10.3 percent. Services and government employment were the only gainers.

Total construction contract awards in the state declined 7.6 percent in November from the same period last year, while West Tennessee had a 26.1 percent decrease. The year-to-date total in the state declined 46.4 percent. West Tennessee total construction awards for the 11 months were down 7.5 percent, almost half the decline in the nation. Residential building awards in November increased 49.3 percent in the state, but the increase was not enough to offset a 26.1 percent decline in non-residential building. Dwelling unit starts for the 11 months were 25,737 in Tennessee, 21.2 percent below the same period in 1979.

Mortgage loans made by the Federal Home Loan Banks declined 8.9 percent in November and 26.3 percent for the January-November period from comparable periods in 1979. The net savings flow was up in November compared with an outflow of funds the year before. The 11-month total increased 53.5 percent.

Data on banking activity of member banks of the Federal Reserve System are only available for West Tennessee. Total loans declined 3.0 percent for the month, while total deposits were up 3.0 percent. These indicators do not compare favorably with those in Arkansas and North Mississippi, nor with all domestically chartered commercial banks in the nation.

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of Soviet cotton agriculture. A reading of Russian literature reveals that cotton may be entering a decade of relatively slow growth. The Russian periodic press has devoted a fair amount of space in 1980 to an analysis of four crucial production factors that are especially troubling to Central Asian growers: cotton plant variety and strain development, land amelioration, harvesting and ginning technology, and skilled manpower. Considerations of length at this time compel a quick summary of the essential features of these factors. The approach is to support general statements with factual evidence on either individual collective farms [*kolkhozi*] and state farms [*sovkhozi*] or districts within larger republican territories. Inasmuch as the Soviets frequently allude to the existence of problems in the national economy by citing local experiences, the inference has been made that recent discussions about the shortcomings of *oblasti* [districts] and collective farms are representative of the entire cotton industry. There is little choice but to use the case-study methodology, because the Russians have not published an industry-wide study of cotton since 1968.[2]

Cotton cloth makes up 60.0 to 70.0 percent of all fabric manufactured in the USSR.[3] Since cloth comprises such a large proportion of the textile industry's output, Moscow is pressing hard for the improvement of cotton plant varieties and for their adoption by collective and state farms. Presently, long-staple varieties only account for slightly more than one-half the gross cotton production. Data for Maryinsk *oblast'*, Turkmen SSR, provide an excellent clue as to how well the Soviets are proceeding in improving the quality of their crop. During the past four harvests, this district has increased aggregate production of fine cotton by 7.0 percent and raised yields per hectare by 27.4 percent. Thus, Soviet plant biologists and agronomists are progressing steadily with the development of better strains of cotton.

Table 3

COMPARISON OF ALL COTTON VARIETIES TO LONG-STAPLE VARIETIES FOR ACREAGE, PRODUCTION, AND YIELDS IN MARYINSK OBLAST', TURKMEN SSR, 1976—1979

	Acreage (in Thous. Ha.)			Production (in Thous. Metric Tons)			Yields (in kg/ha)	
Year	All	Long-Staple	%	All	Long-Staple	%	All	Long-Staple
1976	204.0	86.2	42.3	321.2	106.2	33.2	1,570	1,240
1977	205.4	88.0	42.0	373.8	112.2	30.2	1,820	1,270
1978	206.2	89.8	43.5	381.4	127.0	33.3	1,850	1,420
1979	205.0	106.1	51.8	405.0	168.0	40.2	2,000	1,580

Source: *Khlopkovodstvo*, 3 (March 1980), 2.

[2]Ministry of Agriculture, *Dostizheniia nauki po khlopkovodstvu* [The Achievements of Science in Cotton Production], Tashkent, 1968.

[3]"K voprosu ob agropromyshlennykh predpriiatiiakh v khlopkovodstve" [Problems with Cotton Agro-industrial Enterprises], *Khlopkovodstvo*, 1 (January 1980), 5.

The Soviets are especially pleased with a variety known as "Tashkent 1." Two-thirds of this year's cotton acreage in the Uzbek SSR, where the plant was developed, is sown in Tashkent 1 strains. Owing to the plant's suitability to varying climatic and soil conditions, Tashkent 1 is becoming a favorite of growers throughout the Central Asian cotton belt. Agricultural officials report that 40.0 percent of the 1979 crop was in strains of Tashkent 1.[4] Its staple length and strength, as the following table attests, make it ideal for the milling of high quality fabric.

Table 4

STAPLE LENGTH AND STRENGTH FOR STRAINS OF TASHKENT 1 GROWN IN THE UZBEK SSR, 1975 AND 1979

	Staple Length (in mm.)		Staple Strength (in Grams)	
Strain	1975	1979	1975	1979
Dal'verzinsk	32.8	32.5	4.5	4.8
Baiautsk	32.2	31.9	4.3	4.9
Dzhizaksk	32.4	32.2	4.3	4.8
Andizhansk	32.1	31.9	4.3	5.0
Moskovsk	32.4	32.2	4.4	4.9
Bagdadsk	31.9	32.5	4.4	5.0
Kuvinsk	32.5	32.2	4.6	4.8
Turakurgansk	32.5	32.1	4.5	5.0

Source: *Khlopkovodstvo*, 6 (June 1980), 13.

Although the Soviets are moving ahead with the development of new varieties, they are still confronted with some very serious boll characteristic problems. The staple-to-seed ratio, or lint turnout, is a disappointing 29.0 to 30.0 percent.[5] Moreover, there is speculation in the Soviet Union that the 1980 harvest may show a reversal in the recent upward movement of staple quality. The plan for 1980 set a target of 8.85 million tons of long-staple cotton, a substantial increase by Soviet standards over the previous year's 8.0 million. Preliminary reports indicate that Russia will achieve its goal of producing not less than 9.0 million metric tons of cotton in 1980, including the long-staple target of 8.85 million. Uzbekistan, the largest producing republic, with about 96.0 percent of the crop collected as of October 31, has already exceeded its plan norm of 5.58 million tons by 124,773 tons. It has harvested 332,201 tons of long-staple cotton.[6] If other republics do as well, the cotton crop for the concluding year of the Tenth Five-Year Plan will match Soviet expectations. However, judgment will have to be suspended for now on productivity and quality until Russian statistics and evaluations are released in January.

Russian agricultural planners anticipate that part of the growth in productivity for 1980 will flow from land amelioration projects. Much cotton acreage in Central

[4]"Sortovye priznaki elity i kachestvo khlopka" [Quality Indicators of Cotton Varieties], *Khlopkovodstvo*, 6 (June 1980), 12.

[5]USDA, Foreign Agriculture Circular, *Cotton*, April, 1980, p. 2.

[6]*Pravda vostoka* [The Truth of the East], November 1, 1980, 2.

Asia—especially arable that was prepared for cotton planting many years ago—needs extensive drainage and irrigation repairs. In more than half of these fields the drainage systems have deteriorated to a point where advancing soil salinification is reducing yields.[7] On some acreage the drainage networks have failed altogether, and once productive fields have turned into marsh. While Moscow considers land renovation the most rapid and least expensive device for raising cotton productivity, it is not allocating enough funds, technology, and manpower for conservation. The Kremlin's stinginess with resources has prompted party and governmental bureaucrats to voice their complaints publicly in the authoritative cotton journal *Khlopkovodstvo* [*Cotton Production*]. These bureaucrats point out that between 1966 and 1978 only 74.0 percent of the drainage and irrigation projects planned were completed.[8] Even more annoying to them is the declining volume of land improvement programs in the more recent five-year plans. The eighth plan [1965-70] had called for an annual reconstruction of 20,000 hectares; the tenth [1976-80] designated a mere 12,000 hectares for amelioration work. Central Asian cotton specialists assert that in the absence of a strong commitment to conservation from all-union and republican ministries, the state's production goals, particularly for long-staple cotton, will be difficult to meet in the future.

In addition to the deteriorating condition of drainage systems, Central Asian growers worry about inadequate supplies of chemical fertilizers. Seventy percent of cotton arable is deficient in phosphorus, an essential nutrient for the better varieties of cotton. Phosphorus pentoxide [$P_2 0_5$] levels vary from 0.0mm/kg to 30.0mm.[9] Russian agronomists estimate that yields are reduced four to twelve quintals [100kg] per hectare and staple length 1.7mm because of the low phosphorus content of soils in the cotton belt. When liberal applications of chemical fertilizers were tried on *kolkhozi* and *sovkhozi*, productivity increased dramatically. For example, in twenty-three field experiments in Uzbekistan in 1979, a nitrogen-phosphorus-potassium compound to the kilogram ratio of 320:200-260:100 produced yields from 40.0 to 42.0 quintals a hectare. This was well above the republic's average of 31.3 quintals.[10]

It is very unlikely, however, that supplies of fertilizers will be forthcoming to the extent necessary for proper plant maturation, since the processing of chemicals is geared primarily to the needs of heavy industry. The lead article in the January 1980 edition of *Khlopkovodstvo*, which may be interpreted as a policy statement, advised growers to employ cotton-alfalfa rotation as a substitute for a complete chemical fertilization program.[11] The didactic tone of the editorial suggested that central planners have recommended crop rotation techniques in the past, but that they have not received an enthusiastic response. The opening paragraphs chided cotton growers for "underestimating the role of crop rotation in increasing soil fertility." The statement then catalogued the nitrogenation benefits of successive alfalfa sowings, asserting that yields will rise 6.0 to 10.0 quintals per hectare. It is also claimed, but without supporting evidence, that costs for fertilization will drop by as much as 35.0 percent. An additional motive is also cited for exhorting cotton growers to use a three-year alfalfa rotation system. Moscow has promised its beleaguered citizens that per capita levels of meat consumption will be raised. But with feed-grain production unable to keep pace with the demands of livestock enterprises, that pledge will be difficult to fulfill. This spring and summer the Russians vigorously encouraged the planting of fodder crops. Too great a dependence on feed grain imports is a very risky expedient, especially in periods of global crisis. This was made clear by the Western reaction to the Afghanistan invasion, and in response the Soviets are desperately trying to build up their fodder reserves. Cotton, they hope, will play an important part in aiding the faltering livestock industry of Kazakhstan and Central Asia by contributing its share of animal feed crops.

The failure of the Soviet chemical industry to produce sufficient quantities of fertilizers is only one indication of the weak linkages between the manufacturing and agricultural sectors of the Russian national economy. Central Asia's attempts to raise cotton production are severely hindered by the scarcity of cotton harvesting and ginning machinery. A little under one-half the cotton crop is still picked by hand. In Uzbekistan in 1979, only 53.6 percent of the cotton was gathered by machine.[12] During harvest time, brigades of students, teachers, retirees, and factory workers are brought into the fields to become temporary cotton pickers. It appears that the labor-intensive nature of Soviet cotton farming will be an economic fact of life for a considerable time longer. *Gosplan*, the state planning agency, continues to promote the development of heavy industry at the expense of agriculture. The assignment to build cotton harvesting and ginning technology belongs to Central Asia; nevertheless, the recent pattern of investment in the USSR does not favor the region. Central Asia's share of all-union investment funds has been declining. *Gosplan*, more and more, is diverting rubles for energy and transportation development in Siberia and for the replacement of obsolete equipment in the older industrial districts of the RSFSR, Ukraine, and other European republics.[13]

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[7]"Zadachi khlopkorobov v zavershaiushchem godu piatiletki" [Problems of Cotton Growers in the Final Year of the Five-Year Plan], *Khlopkovodstvo*, 6 (January 1980), 2.

[8]B. K. Karryev, "O spetsializatsii khlopkovodstva" [On the Specialization of Cotton Production], *Khlopkovodstvo*, 3 (March 1980), 2.

[9]Ibid., 3.

[10]A. Mavlianov, "Udobreniia i kachestvo khlopko-syrtsa" [Fertilizer and the Quality of Cotton], *Khlopkovodstvo*, 6 (June 1980), 3.

[11]"Zadachi khlopkovodstva," *Khlopkovodstvo*, 1 (January 1980), 3.

[12]"Vsesoiuznaia shkola khlopkorobov mekhanizatorov" [The All-Union School of Cotton Tractor Operators], *Khlopkovodstvo*, 7 (July 1980), 18.

[13]N. K. Baibakov, *O gosudarstvennom plane ekonomicheskogo i sotsial'nogo razvitiia SSSR na 1980 god* [On the State Plan for the Economic and Social Development of the USSR in 1980] (Moscow, 1979), passi.

The problems of mechanizing Soviet cotton farming go beyond the shackled circumstances of the agricultural machine-tool industry. Trained manpower to correctly operate the existing pool of harvesting machinery is in short supply. A much heralded experiment, which lays bare the primitiveness of Soviet cotton harvesting procedures, was conducted this season on the Trudyev *sovkhoz* in the Tadzhik SSR.[14] No effort was spared to harvest the cotton crop by high technology. It was one of the first state farms to defoliate by airplane and to pick the bolls entirely by machinery. Special arrangements were made at regional collection centers to provide the Trudyev *sovkhoz* with all the trucks needed to avoid delays caused by harvesting equipment sitting idle in the fields awaiting unloading. No appraisal of the effort has appeared in the Soviet press to date; however, an ordering of Tadzhik *kolkhozi* and *sovkhozi* according to percentage fulfillment of the yearly plan for cotton was published.[15] The Trudyev state farm ranked tenth in the republic among all *sovkhozi*, exceeding its target by 18.1 percent, which may be interpreted as a successful harvest. The purpose of the experiment, according to party officials, is to alter the thinking of those farm managers who still believe that machinery cannot pick cotton as well as the human hand. The implication is obvious: Russian machine-operators do not handle their equipment well. A portion of the harvest each year is ruined by the faulty operation of machinery. The Soviets have admitted, for example, that the 1978 and 1979 Uzbek harvests would have been larger if tractor drivers had been more proficient with their equipment, and that part of the 1980 Tadzhik crop was left in the fields as a result of the improper adjustment of the ground clearance height of picking drums.[16] Thus, the modernization of Soviet cotton growing involves much more than just mechanizing harvest procedures. Moscow and the Central Asian republics must also expand technical education and training.

A student of Central Asian economic development enters upon a very problematical undertaking when attempting to anticipate future trends in cotton production. Moscow's reticence to publish any truly analytical study of its cotton growing industry is exasperating. When judging the performance of cotton in the Soviet Union, one must make inferences from data in press releases and journal articles on individual producing enterprises and districts. The reader should be forewarned that the author's thoughts on the probable growth path of Soviet cotton can yield only tentative prognostications for the decade of the eighties. To venture longer term predictions is perilous. The present uncertain state of the Soviet economy does not preclude the possibility that significant and unforeseen changes in economic priorities may occur by the end of this century. The spectre of heavy industry as the symbol of a mature Marxist society still dominates the economic world view of the Kremlin; yet, there has been some inclination recently to yield to the growing demands of the population for consumer wares. Perhaps the mounting cry of Soviet citizens for more and better clothing may alter Moscow's perception of the cotton industry's needs. To be sure, the production of capital equipment will remain the paramount goal of *Gosplan*, but the necessity to clothe the peoples of the Soviet Union in a more sophisticated fashion than has been done to-date may entice the Russians to turn to the West for technical assistance. The purchase of foreign technology and know-how has become a favorite tactic to compensate for the shortcomings of Soviet agriculture and light industry; it would be the shortest route for the Soviet Union to follow for the modernization of cotton growing.

The Soviets will find it difficult to increase cotton production much above the levels achieved in the current five-year plan without financing a considerable technological modernization program for the Central Asian republics. Traditionally, increased gross cotton yields have sprung from the expansion of arable, that is, from extensive agriculture. The Russians admit that they are approaching the limits to land reclamation in the Central Asian cotton belt. Tadzhikistan, for example, has a total surface area of 4.3 million hectares, of which 30.0 percent is cultivated. However, since the remainder is mostly mountainous terrain, the Tadzhik authorities do not envision any significant extension of arable, even when they take into consideration their land terracing projects.[17] It is also highly improbable that land sown in grain and other crops will be converted to cotton acreage. Central Asia is a major supplier of fresh and canned vegetables, meat, and fruit to all parts of the Soviet Union, especially Siberia and the Soviet Far East. The conversion of this land to cotton production would be sorely felt. Moscow has little choice but to adopt intensive agricultural techniques and to extend amelioration projects on existing cotton arable. The further industrial transformation of Central Asia at a faster rate than at present is imperative; but, as has been argued, this transformation is implausible in the near future since investment capital is scarce for the region.

The very high proportion of underemployed manpower in the cotton republics serves as an additional drag on the rate of technological modernization. Rather than eliminating jobs by the introduction of labor-saving technology, Soviet economic planners prefer to employ persons in labor-intensive work in regions that have large reserves of underutilized manpower.[18] The reasons for the Central Asian case are pragmatic and ideological. To cite an example, Moscow has decided that the Kirgiz SSR will specialize in labor-intensive agriculture and consumer industry, thereby reducing the flow of all-union invest-

[14] *Kommunist Tadzhikistana*, September 20, 1980, 1.

[15] *Kommunist Tadzhikistana*, November 1, 1980, 3.

[16] *Pravada vostoka*, March 20, 1980, 1.

[17] R. K. Rakhimov, *Problemy effektivnosti i puti razvitiia ekonomiki Tadzhikistana* [Problems of Effectiveness and Development of the Economy of Tadzhikistan] (Dushanbe, 1976), 48.

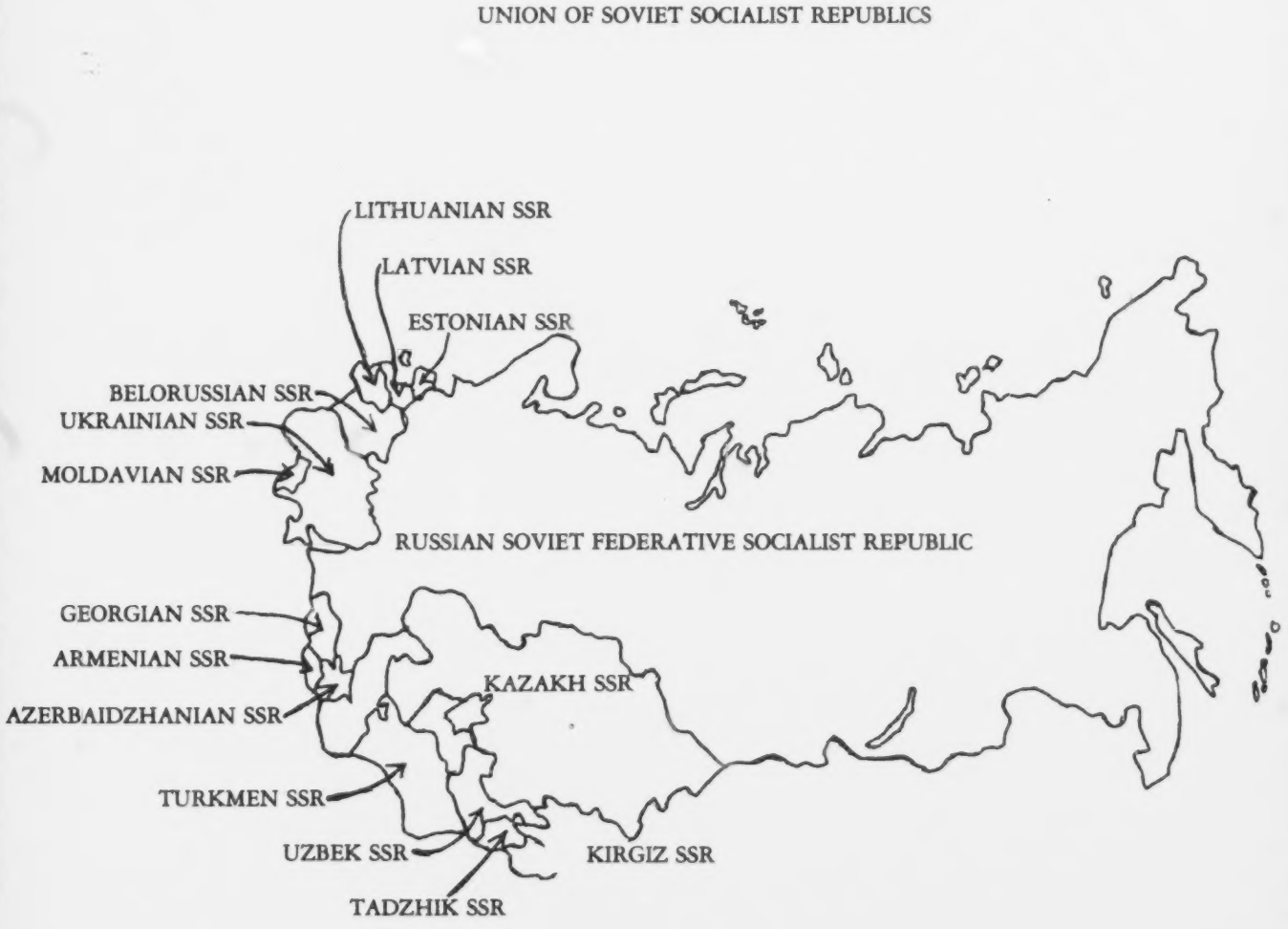
[18] For a discussion in English of this practice, see *Soviet Planning, Principles and Techniques* (Moscow, 1972).

ment funds for real capital formation in Kirgiziia.[19] This directive reflects, first, *Gosplan's* commitment to high priority investments in energy and primary industry and, second, the Kremlin's desire to flaunt the Central Asian republics as a model of Soviet-type modernization.[20] Large-scale unemployment, in Moscow's way of thinking, would not serve that cause. It is better to have Central Asians working with relatively backward techniques than to have them not working at all. Furthermore, Central Asian manpower has displayed a strong antipathy toward interregional migration. The relocation of surplus labor resources is not a feasible solution to manpower problems in Central Asia. Agriculture in the cotton belt for the next ten years will almost by necessity remain labor-intensive.

In conclusion, there will be no noticeable alteration in the yearly percentage increase of cotton production in the Soviet Union during the 1980s. Gross production in the seventies grew at 16.0 percent. We can expect similar annual growth rates for this decade. Growth in productivity and quality must originate in the cotton belt itself, but because of the current energy, manpower, and technological problems of the Soviet national economy, the cotton industry seems headed for a troubled decade. The Kremlin's eye is fixed intently on the faltering economies of the European republics, the untapped natural wealth of Siberia, and the military. Under these conditions, Central Asia will not have a strong claim to all-union financial and technical aid, and without the solicitude of Moscow, severe constraints will be placed on Central Asia's efforts to modernize cotton production.

[19]Institute of Economics, Academy of Sciences, Kirgiz SSR, *Ekonomika Kirgizii* [*The Economy of Kirgizia*] (Frunze, 1977), 62-64.

[20]A brief exposition of this ideological component appears in Alec Nove and J. A. Newth, *The Soviet Middle East: A Communist Model for Development* (New York, 1967).



MARKETING AND THE PEAK LOAD PROBLEM

*Hershey H. Friedman and Linda Weiser Friedman**

Many businesses find that demand for their product/service fluctuates considerably on an hourly, daily, weekly, monthly, or seasonal basis. This gives rise to peaks and troughs in demand. For example, a firm may find that most of its customers arrive during a specific three-hour period within the working day. This, of course, means that the firm requires sufficient personnel, space, and equipment to accommodate peak demand. During the rest of the time, off-peaks, the firm is underutilizing its resources. Many employees have little to do during off-peak hours. They must be retained, however, to satisfy peak-period demand. The same is certainly true for machinery and equipment which must be sufficient to accommodate peak-period usage, but remains idle much of the time.

Two industries which have serious problems with peak-demand periods are electrical utilities and mass transit. Power companies must build sufficient electricity-generating plants to satisfy peaks in demand, whereas the average demand for electricity could be satisfied with far fewer plants. In order to avoid blackouts and brownouts during peaks, a company must build and maintain a lot of excess equipment which is idle most of the time.

Similarly, in the case of mass transit, a tremendous amount of personnel and equipment (trains and buses) is necessary for rush-hour usage but remains unutilized much of the time. Take, for example, the case of a hypothetical bus company. Suppose that maintaining a fleet of 200 buses is sufficient to accommodate customers most of the time. However, because of rush-hour demand, an additional 800 buses must be purchased and maintained. Thus, a total of 1,000 buses must be inspected regularly, serviced, insured, cleaned, painted, etc., just because they are needed for a few hours per day. Also, 800 additional drivers must be available to work during rush hours and are not needed the rest of the time. This is a problem which may or may not be solved by part-time employees, depending upon the availability of part-time drivers and whether the union contract permits the employment of part-time drivers. In any event, it is clear that a large portion of the firm's expenses goes to satisfy the needs of peak-load users.

Obviously, accommodating peak-load demand involves additional costs for the company. There are also, however, costs to be borne by the customer who might have to wait in line during peak-demand periods. Time has an inherent value, namely, there is an opportunity cost attributable to time lost waiting in a peak-period queue. In general, time wasted in peak-period congestion could be put to more productive use. An electrician who could earn $20 per hour, and wastes approximately five hours a week in traffic congestion, has "paid" an opportunity cost of $100. Indeed, as things stand now, most industries which experience peak-demand periods find that saving time is the only incentive their customers have for utilizing off-peak business hours as much as possible. Generally, things tend to move faster during off-peaks.

One solution to the peak-load problem involves the establishment of a peak-load pricing policy, that is, charging peak-load customers more than off-peak customers. There are many reasons why firms which have definite peaks in demand should charge peak users more and off-peak users less. Three reasons for peak-load pricing are:

(1) Since additional equipment and personnel are required to satisfy peak demand, it is only fair that these extra costs be borne by the peak user. Indeed, if one price is in effect at all times, the off-peak user is actually subsidizing the peak user by helping to pay for the additional manpower and equipment needed during peak periods.

(2) Charging peak users more will help to flatten out peaks in demand. This increase will be an incentive for some peak users to shift their business, as much as possible, to off-peak periods. Thus, demand during off-peak periods will increase, and demand during peak periods will decrease.

(3) Much of the demand during peak periods is inelastic. That is, many peak users are relatively insensitive to price changes. Thus, charging a higher price for peak-usage periods will result in maximum profits for a firm. According to economic theory, in order to maximize profits a firm should segment its market, if possible, into elastic and inelastic users and price discriminate on the basis of this segmentation. The inelastic users, being less sensitive to price changes, should be charged more than the elastic users who are more sensitive to price fluctuation. Elastic users have a lesser need for the product/service and may have substitutes readily available. Many peak-load customers tend to be inelastic because they have a strong need for the product/service at this particular time period, and there will usually be few good or comparable substitutes available. For instance, the rush-hour user of mass transit has an inelastic demand for this service if he cannot juggle his schedule around in order to be able to travel at a different time of day. Since a large

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portion of these rush-hour commuters are employees, who must get to work when their employers want them, they will tend to be inelastic. In addition, the substitutes for mass transit (e.g., automobile or walking) may be impractical and /or expensive.

Charging higher prices during peak periods will often lead to the following results. Some peak users will shift to off-peak periods, reducing the size of the peaks. However, since the majority of peak demand is usually inelastic, there will still be many peak-period customers paying the higher price. This may allow the firm to lower the rates for off-peak customers. As an added benefit, service during peak-period operation should improve due to the somewhat lower demand (e.g., less congestion in a subway system). This may help soften the blow of the price increase for peak users.

Peak-load pricing has been used successfully by several industries. Airlines, for example, charge considerably more for "in-season" flights than for "off-season" flights. The telephone company has several rates (day, evening, night), with the highest reserved for peak periods. Theatres and nightclubs also charge more for their peak-demand periods (e.g., Saturday evening).

In France, electricity is charged at variable rates rather than at a fixed rate. These rates are related to the costs of supplying electricity for the particular season and time of day. Thus, at peak times the rate for electricity usage is considerably higher than at off-peak times. During the winter, when the availability of hydroelectric energy is curtailed because of the ice and utilities must use more expensive means of generating power, the rates are higher. Similarly, during those hours of the day when electricity usage is at its peak and the cost of supplying it is higher, the rates go up. This approach to pricing has worked quite well and has helped to flatten out, somewhat, the peaks in electricity usage. In parts of New York State, Con Edison, a major utility, is experimenting with peak-load pricing as a means of flattening out the peaks in electricity consumption.

Unfortunately, many firms with very pronounced peak-demand periods have not taken advantage of peak-load pricing. Anyone who has had the misfortune of going to the bank at the wrong time—during a peak period—and waiting in line for an hour or longer has witnessed first-hand the negative aspects of peaks in demand. Of course, banks cannot be expected to charge customers extra for using the bank during peak periods, but they can reward the off-peak user with an inexpensive premium (keychain, pen, etc.). At the very least, banks should inform their customers as to when they typically experience crowds and when they are relatively uncongested. This simple piece of information would make everyone concerned much happier. Customers could not then blame the bank for the long queues since they could just as well have come during an off-peak period. And, since demand peaks should flatten out somewhat as some customers shift to off-peak periods, this should improve bank service and, perhaps, even result in reduced bank labor costs.

Supermarkets, which tend to be overcrowded toward the end of the week (Thursday, Friday, and Saturday) and at particular time periods during the day, might be able to alleviate the situation by applying some of the abovementioned principles to their particular situation. Since it is not feasible to raise prices during peak periods, the supermarkets should offer incentives to shop during off-peaks. Supermarkets could offer special promotions, available only during off-peak hours, such as coupons redeemable only during off-peaks or specially colored cash register tapes available during off-peaks which can be exchanged for gifts, contests, prizes, etc.

Restaurants, fast-food chains, and many retail establishments could also benefit from peak-load pricing. They typically have well-known peak-usage periods. Restaurants, for example, can institute specially reduced rates for "early" and "late" diners and thus relieve congestion during traditional meal hours. Considering the high cost of eating out, many customers would gladly rework their eating schedules in order to save money.

Many computer centers experience the problem of peak-demand periods, manifesting themselves either in a large backup of jobs or a long wait on a timesharing system. Peak-load pricing would be a simple solution, since there would be an economic incentive for off-peak use of the facility. The post office can relieve holiday mail congestion by charging more during this peak mailing period. Letters sent during the holiday peak might, for example, require 20 cents postage instead of 15 cents. This should help even out the demand for mail service.

Tunnels, bridges, and highways should charge peak users a higher toll. After all, more lanes are required because of peak-load traffic and more personnel are needed to man the additional tollbooths. A higher toll for rush-hour drivers might help eliminate some traffic congestion and increase revenues.

The problem of peak-hour expressway congestion cannot be solved by building additional superhighways. Apparently, the more capacity available, the greater the number of cars using that extra capacity. Thus, traffic congestion during peak hours will always be a problem. Building multi-lane superhighways is not only extremely expensive and wasteful of society's resources, but an ineffective means of reducing traffic congestion. Indeed, computer simulations have shown that to eliminate peak traffic congestion in some cities might require highways with fourteen to twenty-two lanes.

The most viable solution involves charging the peak user a higher toll. One toll at all times for bridges, tunnels, or turnpikes results in many inefficiencies. There is no disincentive for using the bridges and tunnels during peaks. Furthermore, the off-peak user is subsidizing the peak user. After all, the off-peak user would be satisfied with a two-lane highway, a tunnel with only two lanes, or a narrow bridge with only one level. It is the peak user who requires the extra lanes and the wide bridge with a second level.

It is obvious from the above discussion that the problem

(Continued on p. 24)

A HISTORY OF AIR TRANSPORTATION IN MEMPHIS[1]

*Donald R. Wells**

Beginnings to 1930

In the early years of the twentieth century, the airplane was such a novelty that it was considered more of a rich man's toy than a means of transportation. The *Commercial Appeal* questioned the airplane's soundness in 1906, wondering if it would ever add to the happiness of mankind. But four years later, that same newspaper offered a $5,000 prize to an aviator named Rene' Barrier for being the first person to fly over Memphis in a Bleriot monoplane.[2] It was also in 1910 that Glenn Curtis, of Curtis Wright, brought a four-day national aviation meeting to Memphis.[3]

There was no officially recognized air field in the Memphis area until 1917, when Park Field was constructed in Millington for the training of World War I pilots.[4] This field was constructed on the site of a former horse-racing track, and the infield of the track served as the landing strip.[5] Park Field was turned over to the Navy in 1942.[6]

The second air field in the area was Armstrong Field, located north of Memphis at Woodstock. The field, named for Lt. Guion Armstrong who was killed in World War I, was dedicated on November 11, 1926, the eighth anniversary of the armistice. Charles Lindbergh landed at Armstrong Field during his nationwide tour after his successful Atlantic flight.[7]

It was also at Armstrong Field on May 7, 1928, that Percy McDonald, an attorney, bought the first round-trip airline ticket from Memphis to Chicago. The ticket, which cost $60, was purchased on Mid-South Airways, an airline operated by Vernon Omlie and his wife Phoebe.[8] This couple brought their flying service to Memphis in 1921. Vernon was a salesman for Curtis Northwest Airplane Company, and Phoebe was a stunt pilot. Vernon later managed the Memphis Airport, until he was killed in a 1936 crash in St. Louis while a passenger on Chicago and Southern Airlines.[9]

Since Armstrong Field was quite a distance from the city, a third airport, called New Brys, was opened on May 8, 1927, on the north side of Jackson Avenue near Warford Street. When constructed, this airport was east of the city limits, but the area was annexed by Memphis in 1929. Arrow Airways used the field for its flights to Little Rock, and Jimmy Doolittle landed the first Ford Tri-motor there.[10] New Brys Field was demolished by a gale wind in the early 1930s but, by then, Memphis' permanent airport on Winchester Road was already in operation.

The Memphis Municipal Airport opened on July 8, 1929, when Winchester Road was still south of the city limits. The airport was able to complete its first full year of operation without a single mishap and with operating income sufficient to meet expenses. In March 1930, the city spent $16,480 for landing lights after a plane could not locate the field at night and had to land in the Mississippi River.

The Great Depression and World War II Period, 1930-1945

Memphis began the 1930s with an airport that has remained in its location on Winchester Road to this day. The first major carrier to use the field was Robertson Airlines, serving St. Louis and New Orleans with single-engine planes. Lindbergh flew with this line before it was absorbed by American Airlines.

Airmail service began from Memphis in June 1931, when American Airlines delivered a letter to Los Angeles in three days. American's route extended eastward from Memphis to Cincinnati, Cleveland, and New York and westward through Ft. Worth to Los Angeles.

American Airlines was the largest carrier in Memphis in the early and mid-1930s. Passenger traffic in the city increased from 7,000 in 1932 to about 11,000 in 1933, causing American to station 27 pilots and 11 ground people in Memphis. American's 1932 schedule took 14 hours to Los Angeles, leaving Memphis at 2:11 p.m. and arriving on the West Coast at 6:13 a.m. By 1935, American added a second flight to Los Angeles and, by then, flight time, including stops, had been reduced to 11 hours. Meals were served on the ground in Ft. Worth and El Paso on the day flight, while the night flight made connections at Ft.

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[1]Except for the sources cited in the footnotes which follow, the data for this article were obtained from various issues of the *Commercial Appeal* and *Memphis Press-Scimitar*. The author may be contacted for a list of the issues utilized.

[2]William D. Miller, *Memphis During the Progressive Era 1900-1917* (Memphis: Memphis State University Press, 1957), p. 184.

[3]Charles W. Crawford, *Yesterday's Memphis* (Miami, Fla.: E. A. Seeman Publishing Co., Inc.), p. 82.

[4]Ibid, p. 96.

[5]Paul Coppock, *Memphis Sketches* (Friends of Memphis and Shelby County Libraries, 1976), p. 123.

[6]Crawford, p. 96.

[7]Coppock, p. 126.

[8]Ibid.

[9]Crawford, p. 105.

[10]Coppock, p. 122.

Worth with the Condor sleeper plane to Los Angeles. The fare charged was $187.42.

The second major carrier to serve Memphis was Chicago and Southern Airlines. The company had been known as Pacific Seaboard Airlines when it operated in California in 1933, but the company adopted the new name when it moved its operations to Memphis in 1934. Chicago and Southern moved its headquarters to St. Louis in 1936 but returned to Memphis in 1940. The city of Memphis was so delighted to have the carrier's headquarters back that it helped the Works Progress Administration (WPA) construct a hanger and an office building. When completed in September 1941, a big celebration was held to dedicate the new headquarters with music provided by the WPA band. Chicago and Southern remained headquartered in Memphis until its merger with Delta Airlines in 1953.

Chicago and Southern gave Memphis its sought-after north-south route in 1935, using Bellanca Pacemakers on the five and one-half hour flight to Chicago and trimotored Stinsons on the four-hour flight to New Orleans. Two-way radios were installed in the planes in 1935. Airline fares were kept equal to first-class rail fares, including pullman space; therefore, in 1936, Chicago and Southern had to reduce its Memphis to Chicago fare from $28.70 to $23.60 to match the depression-induced reduction in rail fares.

In 1936, Chicago and Southern began using 10-passenger Lockheed Electra planes, named "The City of Memphis." In 1937, the airline coordinated its schedule with American Airlines so passengers from New Orleans could connect with American's flight to New York. Unfortunately, the nation's hard times caused Chicago and Southern to drop its morning flight to Chicago in 1937 right after Christmas, resulting in the lay-off of five pilots. In March 1941, this line began serving Houston from Memphis on a three and one-half hour schedule.

The third major airline to serve Memphis was Eastern Airlines, beginning in 1939 with a flight from Tampa, Florida, via Muscle Shoals, Alabama. The flight was scheduled so that passengers could connect with Chicago and Southern's flight to Chicago. By 1940, Eastern was using 14-passenger "Silver Liners" from Douglas on its 110-minute flight to Birmingham and on its five and one-half hour flight to Tampa.

During World War II, civilian air service was reduced extensively because the military had priority on the use of planes. Six of Chicago and Southern's DC-3s were taken over by the Army and the company's repair shops in Memphis were used to repair military aircraft. During this period, Eastern Airlines stopped its service into Memphis altogether, while Chicago and Southern was left with only two flights a day to Chicago and one to Houston. In order to fill the gap, caused by the suspension of Eastern's flights, a firm called Mid-South Flying Service operated a charter service, particularly to Florida. The first fatality ever experienced at Memphis Municipal Airport occurred in 1942 when an Army B-26 bomber crashed, killing five crewmen.

The Early Postwar Era At Memphis Municipal Airport, 1945-1963

The postwar period saw a large increase in Memphis air traffic not only with the arrival of new carriers, but also because of new routes awarded to existing airlines. Chicago and Southern began flying to Detroit in June 1945, to Kansas City in 1947, and to Hot Springs, Arkansas, in 1948. The line experimented with in-flight movies in 1947 on its flight from New Orleans to Havana, Cuba.

In 1945, Braniff Airlines became the fourth carrier to fly into Memphis with its "B-Liner" service to Denver via Little Rock, Oklahoma City, and Tulsa. By the mid-1950s, Memphis had become the second largest city in the Braniff system as far as load factor was concerned, with 74.0 percent of its seats filled on flights leaving the city. In 1959, Braniff began DC-6 service from Memphis to Washington, D.C., and New York.

The fifth trunk carrier to serve Memphis was Capital Airlines, the second oldest airline in the country. Capital established its offices in Memphis in 1947 during a telephone strike, thus experiencing difficulty in obtaining phone service. Therefore, initially the company shared Chicago and Southern's offices in Peabody Hotel's "airline row."

Capital began service from Memphis to New York in June 1947 with stops in either Knoxville or Chattanooga and Pittsburgh. Capital used DC-4s on this route, one of which had been known as "The Sacred Cow," Franklin D. Roosevelt's personal plane used when he flew to a 1943 conference in Casablanca. Thus, by the summer of 1947, there were five trunk carriers serving Memphis Municipal Airport with 84 arrivals and departures daily. Most of the carriers were using DC-3s and DC-4s, but plans were being made to convert to DC-6s and Constellations.

In 1945, American Airlines reduced its flying time from Memphis to New York to four and one-half hours with its 44-passenger Douglas C-54. Three years later American added one-stop service to San Francisco via Dallas. In 1949, Memphis became a stop on American's coast-to-coast freight service.

The sixth airline to begin service in Memphis, Southern Airways, was a regional carrier rather than a trunk line. Southern's operations began in June 1949 with a flight from Memphis to Atlanta, with intermediate stops. The company began its service with a single DC-3 and 36 employees, but within five years, Southern had 24 planes and ranked fourth among the eight carriers in Memphis in the number of passengers carried. Unlike the trunk airlines, Southern received subsidies because it served very small towns, rather than just connecting large cities.

In the early 1950s, Memphis was serviced by several carriers that had only a short tenure in the city. Ozark Airlines flew from Memphis to St. Louis between 1951 and 1954.[11] Two intra-state carriers, Volunteer Airlines and Southeastern Airlines, were unsuccessful and stayed

[11]Pamphlet published by the airport in 1951.

only a few years. Four air taxi companies—Dixie Air Associates, Martin Aviation Corporation, Memphis Flying Service, and Memphis Aero Corporation—carried mainly businessmen and duck hunters within a 200- to 300-mile radius of Memphis.

Chicago and Southern closed its Memphis headquarters in May 1953 when the line was absorbed by Delta Airlines, headquartered in Atlanta.

New aircraft began appearing in Memphis during the mid-1950s. Delta flew the first DC-7 to the city in 1955, and that same year Capital landed turbo-prop jets at the Memphis airport. In 1957, Capital began using turbo-jets, called Viscounts, on flights from Memphis to Washington, D.C., and New York. The Viscount's 335 mile-per-hour cruising speed was slower than some other jets then in use, but it was quieter and smoother and gave faster service because of shorter ground time due to engines not having to be warmed up. These planes took only 1 hour and 53 minutes to fly from Washington to Memphis.

Delta began jet service on its Chicago-Memphis-New Orleans route in 1960 with its 84-passenger Convair 880, which was capable of a speed of 650 miles-per-hour.

In 1956, American and Delta introduced air coach service to Memphis. American had a coach flight to Nashville and New York, while Delta had coach flights to Detroit, New Orleans, and Jackson, Mississippi.

In February 1958, Memphis built the nation's first air freight terminal. The facility covered 3,000 square feet of space at the airport and was shared by all the airlines serving the city.

In June 1961, Capital Airlines was absorbed by United Airlines, leaving Memphis with five trunk carriers.

The Era of Memphis Metropolitan Airport, 1963-1970, And Memphis International Airport, 1970-Present

In June 1963, Memphis Metropolitan Airport opened on Winchester across from the old Municipal Airport, which was renamed Memphis Aero. The new airport is considered one of the most attractive in the nation, especially at night when the lights in front give a "champagne glass" effect. A major expansion program began in 1970, and by late 1974 the airport reached its present size with three terminal buildings.

In October 1963, a Memphis city ordinance created the Memphis Air Service Commission, an official arm of the government. If the Commission determined that air service was poor on a particular route, it would go to the Civil Aeronautics Board (CAB) on behalf of the city and ask for an additional carrier. The Commission was instrumental in getting Southern Airways to offer competition to Delta on the Memphis to Chicago route and obtained permission in 1969 for Southern to offer non-stop service to New Orleans. The Commission pointed out that Delta was enjoying the longest non-competitive run in the nation at that time with its monopoly of the Memphis to Chicago service.

New carriers serving Memphis in the late 1960s were regional ones: Allegheny in 1968, and Frontier, Texas International, and Piedmont in 1969. Frontier, which had merged with Central Airlines in 1967, served Memphis westward to Little Rock, Hot Springs, Tulsa, Ft. Smith, and Oklahoma City. Texas International, formerly Trans-Texas, served Memphis to Little Rock and Dallas. Allegheny, which merged with Lake Central Airlines in 1968, served Memphis northeastward to Nashville, Pittsburgh, Philadelphia, Boston, and many of the major cities of the northeast. Piedmont Airlines served Memphis eastward to Nashville, the Carolinas, and Virginia.

By 1969, Memphis was the leading hub for regional carriers to small towns, but most of the carriers were losing money on their flights. The construction of the Interstate Highway System adversely affected the regional carriers. Many of the carriers' small hops were designed in the day of the DC-3s, but they did not have enough passenger traffic to fill the jet planes that had come into use. In fact, the last DC-3 to land at Memphis was Southern's flight from Dothan, Alabama, in July 1967.

The first through-service between Memphis and a foreign city occurred in 1970 when American Airlines began through flights to Acapulco, Mexico, and Toronto, Canada. Customs for these flights were not in Memphis, however, but in Dallas for the Mexican flight and New York for the Canadian flight. Nevertheless, as a result of these flights, Memphis changed the name of its airport to Memphis International Airport.

In the early 1970s, two trunk carriers began offering additional non-stop service from Memphis. United Airlines had two flights a day to Los Angeles, with one-stop service to San Francisco and San Diego, giving American Airlines competition on this route. Braniff began non-stop flights to Oklahoma City and one-stop service to Denver. Braniff also competed with American on non-stop flights to Dallas.

With the loosening of Federal regulations on the airline industry, several airlines added or deleted some service to Memphis, while boosting fares substantially to offset higher fuel costs. Eastern Airlines, which had been serving Memphis only with non-stop flights to Atlanta, gave up that route in 1979, leaving Memphis with only four trunk carriers. Texas International had only one flight a day to Dallas when it dropped out of the Memphis market. Deregulation, however, brought new service to Memphis on other lines: United made Memphis a hub with non-stop flights to San Diego, Seattle, San Franciso, Las Vegas, and Denver and kept its non-stops to Los Angeles. Braniff tried non-stop service to Pittsburgh and Boston from Memphis in 1979 but discontinued both after a short time.

Southern Airways combined with North Central Airlines in 1979 to form a new firm called Republic Airlines. This consolidation gave Memphis non-stop service to Milwaukee, Minneapolis, and Wichita, Kansas, as well as many direct flights to mid-western cities. Allegheny changed its name to U.S. Air when it added new flights on its routes, but none directly affected Memphis. Another regional carrier, Scheduled Skyways, Inc., began operations in 1980 with non-stop service from Memphis

to Little Rock and Fayetteville, Arkansas, and connections to Kansas City and Dallas.

In the late 1960s and early 1970s, airline skyjacking became a serious problem throughout the country. After experimenting with armed sky-marshalls riding on random flights, the government considered the use of metal detectors to screen passengers before boarding. As late as October 1972, a bill requiring these "magnetometers" was pending before Congress, but no immediate action was taken. However, on Friday night, November 10, 1972, Southern Airways flight #49 left Memphis for Birmingham, where it was scheduled to stop before going on to Florida. This flight was hijacked by persons boarding in Birmingham, and after an ordeal that lasted the whole weekend, finally landed in Cuba. This crime motivated Congress to make metal detectors mandatory at all the nation's airports.

A Memphis entrepreneur, Fred Smith, revolutionized the air package freight business in March 1973 when he founded Federal Express. Smith is the son of Frederick Smith, founder of Smith Motor Coach Company, the first inter-city bus company to serve Memphis back in 1925, and later President of Dixie Greyhound Lines. The younger Smith got the idea for the package freight business while he was a student at Yale. Federal Express handles packages only up to 70 pounds maximum but guarantees next-day delivery in many parts of the country. To accomplish this, Federal Express handles the package from pick-up to final delivery using its own trucks and flies mainly at night to make next-day delivery easier. This operation, while quite different from the containerized freight that large passenger lines carry, has proved so successful that new firms have already entered this specialized industry.

From the time of the first officially recognized air field in Memphis in 1917 until the present day, the growth of the air transportation industry in the city has been tremendous. At the time of the writing of this article, the latest figures available showed that over 4.4 million passengers had been serviced at Memphis International Airport. During the same period, enplaned and deplaned air express totaled 1.2 million pounds; air mail, 35.2 million pounds; and air freight, 56.8 million pounds. The air transportation industry has definitely had, and will continue to have, a sizeable impact on the Memphis economy.

(Continued from p. 20)

of peaks in demand is a common one which can be quickly alleviated by a well-thought-out strategy.

Firstly, it is important for a firm to monitor demand to determine if and when peaks occur. The next step is to conduct research to ascertain the nature of the peak user. That is, how elastic are the peak users? And, what proportion of peak users would shift to off-peaks if faced with a particular peak-load price increase (or off-peak price decrease)? This research could easily investigate consumer reaction to several different price increases. Armed with this information, management could then determine the optimal price increase and estimate the effects thereof.

Any peak-load pricing scheme should include extensive promotion of off-peak usage. The promotion of off-peak hours should stress the lower cost to consumers and the speedier service due to less congestion. If peak-load pricing cannot be instituted, at the very least off-peak usage should be heavily promoted and rewarded with inexpensive premiums, where feasible.

In conclusion, every firm should, if possible, take advantage of peak-period pricing. In these days of stagflation any means of lowering costs, increasing profits, and improving customer service should be considered.

PREDICTING EMPLOYEE ATTITUDES TOWARD UNIONS

*David E. Robertson**

Attitudes toward unions are mediated by broad social, political, and economic value orientations. Such attitudes tend to vary by appointment status, income, social class, economic satisfaction, age, education, seniority, and attitudes toward management.[1] Attitudes toward unions are important, because attitudes tend to have a direct impact on participation in union activities. Attitudes toward unions are thus likely to affect the success of organizational drives, the outcome of representation elections, the climate of labor relations, and other activities including public policy.

This article examines the impact of two basic variables, sex and race, on attitudes toward unions. Many studies have compared differences in job attitudes by sex and by race,[2] but none were located which treat both variables in combination, especially as related to attitudes toward unions. The purpose of this article, therefore, was to determine the effect of the separate and combined interaction of sex and race on attitudes toward unions, considering the four groups formed by these variables (white males, white females, black males, and black females).

Method of Study

The subjects for the present study consisted of 331 employees from four Southern firms: an industrial organization, a hospital, a health clinic, and a city government. Ordinarily, surveys of this type involve the measurement of many variables in a single organization. The present study dealt with only a few variables, but encompassed several organizations in two geographically separated communities. There are a number of reasons for this. First, there is increasing evidence that the results of behavioral or attitudinal studies are often inconsistent across various research sites.[3] It could be argued, therefore, that exploratory studies might well be taken from samples that include many different types of employment situations or conditions. Second, gaining cooperation from employers who could furnish enough questionnaires for the study was difficult, because many of the questions in the present study were of a sensitive nature.

The characteristics of the sample are shown in Table 1. Of the 331 employees participating, about 15.0 percent were black, 40.0 percent were female, and 29.0 percent were union members. Two of the participating organizations were unionized; two were not. There is no doubt that the sample was dominated to some extent by industrial employees and nurses. The responses from the technicians in the small health clinic might well have been lumped together with responses from the hospital because there were no significant differences between these two on responses to the survey items. Still, the contributions of this organization and the small city government organization were believed to be useful in reducing the narrow scope that is sometimes associated with single-organization studies. It is true that broad-based samples make it more difficult to control organizational variables, but the advantages of a broad base are thought to outweigh the costs of less control over organizational variables.

The instrument used in this study was a ten-item questionnaire of Likert scale design with five points measuring subjects' extent of agreement. The ten items forming the scale constituted those items from a recent study which had successfully discriminated between union and management roles in collective bargaining simulation exercises.[4] Questionnaires were distributed through company channels with a transmittal letter from the personnel director but were mailed by each employee directly back to the researcher. Subjects were guaranteed that their responses would remain anonymous. Response rates in the four firms sampled varied from 35.0 percent to 90.0 percent. There may have been some selective bias attributable to the voluntary nature of questionnaire return procedures, but such bias was thought to be minimal.

Results

There were no significant differences between blacks

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[1]H. George Frederickson, "Role Occupancy and Attitudes Toward Labor Relations in Government," *Administrative Science Quarterly*, Vol. 14, No. 4, December 1969, 595-605; Chester A. Schriesheim, "Job Satisfaction, Attitudes Toward Unions, and Voting in a Union Representation Election," *Journal of Applied Psychology*, Vol. 63, No. 6, 1978, 548-552; Bernard M. Bass and Charles W. Mitchell, "Influences on the Felt Need for Collective Bargaining By Business and Science Professionals," *Journal of Applied Psychology*, Vol. 61, No. 6, 1976, 770-773; M. Alsikafi, W. J. Jokinen, S. L. Spray, and G. S. Tracy, "Managerial Attitudes Toward Labor Unions in a Southern City," *Journal of Applied Psychology*, Vol. 52, No. 6, 1968, 447-453.

[2]See, for example, M. G. Pryor and R. W. Mondy, "How Men and Women View Their Jobs and What This Means to the Supervisor," *Supervisory Management*, Vol. 23, No. 11 (November 1978), pp. 17-24; and Spencer D. Jordan, "A Comparison of Black and White Employees in Racially Homogeneous and Heterogeneous Companies: Internal-External Control Expectancies, Powerlessness, Instrumental Work Orientation, Organizational Identification, and Turnover" (unpublished dissertation, Michigan State University, 1973).

[3]J. Kenneth White, "Generalizability of Individual Difference Moderators of the Participation in Decision Making Employee Response Relationship," *Academy of Management Journal*, Vol. 21, No. 1 (March 1978), pp. 36-43.

[4]David E. Robertson, "Changing Attitudes Toward Unions with Bargaining Simulation," *Arkansas Business & Economic Review*, Vol. 12, No. 2, July 1979.

Table 1

SAMPLE CHARACTERISTICS

Type of Firm	Employee Classification		Union Affiliation		Sex		Race		Total
	Non-Managerial	Managerial	Union	Non-Union	Male	Female	White	Black	
Industrial Organization	95	92	66	121	160	27	169	18	187
Hospital	78	25	29	74	26	77	76	27	103
Health Clinic	9	9	0	18	2	16	16	2	18
City Government	19	4	0	23	11	12	22	1	23
Total	201	130	95	236	199	132	283	48	331

and whites or between males and females on perceptions of the possibility of having dual loyalty to company and union. When the sample was broken down by sex controlling for race, it became evident that white males and black females were both significantly more receptive to the notion of dual loyalty than were white females. These and other results are shown in Tables 2 and 3.

Race was apparently much more important than sex in determining beliefs about whether or not the law gives too much support to labor unions. Blacks, especially black males, tended to disagree more strongly than whites of both sexes that the law gives too much support to unions. Analysis of item three seems to suggest that sex was more important than race in determining the extent to which employees believed that unions obtain more benefits for employees than would be obtained without them. White females were less sure about such benefits.

Female employees were much stronger in their support of "right-to-work" laws than were male employees. This relationship held true especially for white females as compared with white males. The fifth item results suggested that females, especially white females, were more likely than male employees to trust management to act in their best interest without a union. Here again, sex appeared to be a more potent indicator than race in predicting the extent of trust employees place in management.

Responses to item six resulted in significant differences between means both by sex and by race. Blacks more than whites and males more than females apparently perceived that being represented by a union tends to increase an employee's job security. Blacks (male and female alike) were significantly more likely than whites to trust union leaders to act in the best interest of union members.

Blacks perceived, a great deal more than whites, that unions provide more fellowship and social satisfaction than would be possible in the absence of a union. To a lesser but still significant extent, black males exceeded black females in their positive view of unions as a source of social satisfaction. There is no doubt that race was the most potent predictor on this item.

The tenth and last item produced significant differences between means comparing both sex and race. Females were more likely than males to believe that the benefits of union membership were not worth the cost of dues. To a lesser but still significant extent, whites were more likely than blacks to indicate that, on balance, union membership was not worth the cost.

Discussion

There are one or two general patterns one can note in examining the results of these ten items taken as a whole. First, and perhaps foremost, there was persistent and widespread skepticism about unions among white female employees. Dual loyalty to union and employer is an established fact of life, yet relatively fewer white females were willing to accept this notion (item one). White females also were relatively stronger than other groups in their support of "right-to-work" laws (item four). This survey was conducted in a "right-to-work" state, but white females voiced far more objection to compulsory unionism than white males, or for that matter, blacks of both sexes. At the same time, white females expressed the strongest extent of agreement that the law gives too much support to labor unions, the greatest extent of belief that management can be trusted to act in the best interest of employees without a union, and the least agreement that unions tend to increase an employee's job security. Also, white females were most likely to believe that unions tend to produce bad feelings between employees and management and most likely to believe that the benefits of union membership were not worth the cost of monthly dues as compared with other groups (white males, black males, and black females).

The reason for these attitudes may be partly a function of sample characteristics. White females would be expected to be somewhat more anti-union because less than 25.0 percent of this group was organized as compared with about 29.0 percent of the entire sample. Also, one might suspect that the sample being heavily weighted by nurses would account for such attitudes since previous research has documented the preference for strong leadership and high structure in the nursing profession.[5]

One final observation about white females was that they

[5]V. Wilson, "An Analysis of Femininity in Nursing," *American Behavioral Scientist*, Vol. 15, No. 2 (1971), pp. 213-220.

Table 2
MEAN RESPONSE COMPARISONS BY SEX CONTROLLING FOR RACE

Item	White		Black	
	Sex	Mean	Sex	Mean
1. If you are truly loyal to your employer, you can't be loyal to a union at the same time.	Male	3.5	Male	3.3
	Female	3.1*	Female	3.8
2. The law gives too much support to labor unions.	Male	2.9	Male	4.3
	Female	2.9	Female	3.5*
3. Unions obtain more benefits for employees than would be obtained without them.	Male	2.2	Male	2.0
	Female	2.8*	Female	2.4
4. You should not be required to belong to a union to hold a job.	Male	2.1	Male	2.2
	Female	1.6*	Female	1.9
5. Management can usually be trusted to act in the best interest of the employee without a union.	Male	3.4	Male	3.7
	Female	2.8*	Female	3.7
6. Being represented by a union tends to increase an employee's job security.	Male	2.4	Male	1.8
	Female	2.8*	Female	2.3
7. Union representation tends to produce bad feelings between employees and management.	Male	3.0	Male	3.3
	Female	2.7*	Female	3.4
8. Union leaders can usually be trusted to act in the best interest of union members.	Male	3.0	Male	2.4
	Female	2.9	Female	2.5
9. Belonging to a union provides fellowship and social satisfaction that would not be possible in the absence of a union.	Male	3.6	Male	2.3
	Female	3.6	Female	3.0*
10. The benefits of union membership are worth the cost of monthly dues.	Male	3.3	Male	3.9
	Female	2.7	Female	3.4

*Statistically significant difference between males and females.

Note: Means are average responses for groups ranging from 1 (strongly agree) to 5 (strongly disagree).

apparently distrusted union leaders less than white males, which was inconsistent with the other anti-union attitudes discussed above. Some of the difference here may be explained by traditional sex role stereotypes. The responses to questions five and eight taken together seem to suggest that females, particularly white females, are more trusting of both union and management leaders than are males.

Another finding of interest in this study was the great difference between races with regard to perceptions of appropriate amount of legal support to be given to unions (item two). In retrospect, it is perhaps not too surprising that blacks should deny that the law gives unions too much support. The law has certainly been a positive force in helping blacks achieve equal employment opportunity. Both the union movement and the civil rights movement are similar in that they have advanced through legally sanctioned collective action.

One mildly surprising finding is the difference produced on the item dealing with the social role of unions. The first surprise was the substantial degree to which blacks exceeded whites in perceiving the union as a source of fellowship and social satisfaction. There were no consistent results suggesting racial or cultural differences with regard to social needs; however, one might speculate that unions would tend to provide some source of social identity for those blacks suffering status deprivation off the job. A second puzzling finding here was that this social role for unions was more prominent among male employees than female employees. Previous research has indicated rather consistently that females attach more importance to social satisfaction at work than males.[6] It appears that further study may be necessary to explain this phenomenon.

Looking at all questions together, it is clear that black males were most favorably disposed toward unions, while white females were least favorably disposed. In general, blacks as a race were more pro-union than whites just as males were more pro-union than females, although much care must be taken in trying to extend these findings to other situations. Sex and race together explain only about 6.0 percent of the variance in attitudes toward unions. While it is obvious that union membership counts for a much larger percentage of the total variance, a more intriguing and difficult question is the extent to which union membership preceded the development of such attitudes or the extent to which such attitudes preceded union organization. Any ultimate theoretical explanation for variance in attitudes toward unions would have to take into account a probable reciprocal effect.

The results of this study have implications for management and labor representatives interested in understanding factors affecting organizational drives. If the results can be generalized, one might expect the least resistance to organization from black males and the most resistance from white females. In general, attitudes toward unions were slightly more affected by sex than by race, although differences were not great. Management should

[6]E. D. Jacobsen, D. Trumbo, G. Cheek, and J. Nangle, "Employee Attitudes Toward Technological Change in a Medium Sized Insurance Company," *Journal of Applied Psychology*, Vol. 43 (1959), pp. 349-354.

Table 3

MEAN RESPONSE COMPARISONS BY RACE CONTROLLING FOR SEX

Item	Male		Female	
	Race	Mean	Race	Mean
1. If you are truly loyal to your employer, you can't be loyal to a union at the same time.	White	3.5	White	3.1
	Black	3.3	Black	3.8*
2. The law gives too much support to labor unions.	White	2.9	White	2.8
	Black	4.3*	Black	3.5*
3. Unions obtain more benefits for employees than would be obtained without them.	White	2.2	White	2.8
	Black	2.1	Black	2.4
4. You should not be required to belong to a union to hold a job.	White	2.1	White	1.6
	Black	2.2	Black	1.9
5. Management can usually be trusted to act in the best interest of the employee without a union.	White	3.4	White	2.8
	Black	3.7	Black	3.4*
6. Being represented by a union tends to increase an employee's job security.	White	2.4	White	2.8
	Black	1.8*	Black	2.3*
7. Union representation tends to produce bad feelings between employees and management.	White	3.1	White	2.7
	Black	3.3	Black	3.4*
8. Union leaders can usually be trusted to act in the best interest of union members.	White	3.0	White	2.9
	Black	2.4	Black	2.5
9. Belonging to a union provides fellowship and social satisfaction that would not be possible in the absence of a union.	White	3.6	White	3.6
	Black	2.3*	Black	3.0*
10. The benefits of union membership are not worth the cost of the monthly dues.	White	3.3	White	2.7
	Black	3.9*	Black	3.4*

*Statistically significant difference between whites and blacks.

Note: Means are average responses for groups ranging from 1 (strongly agree) to 5 (strongly disagree).

also recognize the importance that black males apparently attach to the social aspects of unions.

With a better understanding of what draws employees to unions, management should be able to design effective personnel programs to provide alternatives to organization and thereby accomplish some of the same things for their employees that unions, by their very presence, are able to accomplish. Unions, on the other hand, can use the same information to direct their efforts toward more successful organizational campaigns.

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FACTORS INFLUENCING SHIPPING MODE CHOICE: THE MARKETING IMPLICATIONS FOR MEMPHIS-BASED CARRIERS

*Garland Keesling**

Interest and research in carrier marketing activities have experienced considerable growth in recent years. Of particular interest has been the focus on the carrier service variables shippers consider in either developing or restructuring their transportation needs.[1] Transportation mode choice is a very important decision and in many respects is the key element in a firm's physical distribution system. Consequently, it is imperative that a firm's transportation mix properly interface with the entire logistical system so as to provide the most efficient operation between the system components (e.g., packaging, production, facility location, warehousing, and inventory control).

Given the importance of this decision, it can generally be argued that a carrier's "preunderstanding" of a shipper's modal selection process can potentially permit carrier management to operationalize this knowledge into a more effective marketing program. That is, a carrier possessing advance insight of those service attributes shippers consider of the utmost importance will possess a competitive edge in maintaining and attracting shipper accounts. This is particularly true in a highly competitive and deregulated environment.

Therefore, the levels of carrier service are the essence of transportation marketing, and any additional knowledge about the "mechanics" of modal selection only adds to the potential effectiveness of carrier marketing. However, the literature and the author's discussions with transportation specialists leave many questions unanswered regarding the completeness of the service variables that are relevant in the shippers' decision-making criteria. To this end, the information presented in this study attempts to provide a clearer understanding of carrier marketing by examining the selection factors used by shippers in shaping their transportation mix.

Methodology

To learn more about how traffic managers actually make the decision to choose a carrier, a questionnaire was mailed to the largest shippers located in the Memphis SMSA.[2] The sample consisted of 154 firms, from which 38 usable questionnaires were returned for a response rate of nearly 25 percent. Although the response rate was not as high as desired, an examination of the questionnaires returned suggests they are representative of the queried population. It is therefore believed that the survey findings are reliable.

A comprehensive list of transportation service characteristics was developed from such sources as research reports, textbooks, journals, and discussions with transportation consultants and practitioners. There were forty specific questions, covering four underlying carrier selection areas:

1. Annual volume of freight shipped by modal alignment. Modal split information was obtained by asking for the percentage of the traffic manager's inbound and outbound freight transported by truck, rail, air, and water.
2. Sources consulted by the shipper to assist in selecting the carriers to be included within the transportation mix.
3. A specification of factors that are essential in the actual selection of carriers.

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[1]Illustrative of the current studies on modal choice are: Edward J. Bardi, "Carrier Selection from One Mode," *Transportation Journal*, Fall 1973, pp. 23-29; William S. Christenberry, "The Relationship of Freight Modal Split to Shipper Perceptions of Transportation Service Characteristics," *Transportation Research Forum Proceedings*, 18, no.1 (1978), pp. 515-22; Roger E. Jerman, Ronald D. Anderson, and James A. Constantin, "How Traffic Managers Select Carriers," *Distribution Worldwide*, September 1978, pp. 21-24; Robert A. Robicheaux and Ernest R. Cadotte, "Shippers' Perceptions and Preferences for Motor Carrier Performance in Urban Areas: Implications for Consolidation Programs," *Transportation Research Forum Proceedings* 17, no. 1, (1976), pp. 152-59; and Peter Watson, James Hartwig, and William E. Linton, "Factors Influencing Shipping Mode Choice for Intercity Freight: A Disaggregate Approach," *Transportation Research Forum Proceedings* 15, no. 1 (1974), pp. 138-44.

[2]The largest shippers were defined as firms employing in excess of 100 employees within the four counties of Shelby, Crittendon, DeSoto, and Tipton.

Table 1

MODAL DEPENDENCY ACROSS SHIPPER CLASSES
(In Percentages)

Class[1]	Inbound				Outbound				Outbound Private Carriage
	Rail	Motor	Water	Air	Rail	Motor	Water	Air	
I	38.89	59.42	0.82	0.85	10.77	88.10	0.11	1.02	26.77
II	35.92	49.69	14.23	0.15	24.31	67.31	7.69	0.69	0.31
III	22.58	62.55	14.29	0.58	34.08	65.13	0.39	0.39	52.83

[1]Shipper classes are categorized by annual dollar (factory) volume shipped and are defined as follows:

Class I: $1,000,000 to < $10,000,000

Class II: $10,000,000 to < $20,000,00

Class III: ≥ $20,000,0000

4. The existence of formal shipper policy statements regarding carrier selection and the frequency of evaluating carrier performance levels.

Responses to the questions were rated on a scale of from one to six expressing the perceived importance of the specified carrier selection variable. A value of six was considered "extremely important," a value of one was "not important," and the numbers in between expressed degree of differences.

Analysis

Respondent firms were arbitrarily classified by their annual volumes shipped (wholesale dollar value) and grouped as large (≥$20 million), medium ($10 million to <$20 million), or small ($1 million to <$10 million). Modal split information by shipper classes is provided in Table 1.

An examination of the data reveals that larger-volume shippers appear to be diversifying their inbound freight among the rail, motor, and water modal alignments. The same diversity holds true for outbound freight, although a greater dependency is placed on rail and motor carriage. Explanations for this modal diversification could rest with the shipper's intent to hold down freight cost on inbound shipments with a corresponding policy which emphasizes optimum service levels for outbound shipments. For example, a near elimination of waterborne carriage on *outbound freight movements,* despite their inherent cost advantage, is detectable, with the substitutability of private carriage as an alternative to more expensive for-hire carriage. Even in those cases where for-hire carriage is desirable, large-volume shippers show a relative willingness to use rail transportation. The conversion from for-hire cartage to private carriage among large-volume shippers is a growth phenomenon witnessed throughout the nation and is spurred in large part by the shipper's desire to improve transport service to a level not generally acquired in the competitive marketplace. The willingness to prefer rail transportation as a for-hire carrier for outbound shipments is not clear, but knowledge about the product type (e.g., bulk materials) would undoubtedly shed additional light on this finding.

Conversely, smaller-volume shippers appear to selectively diversify their inbound freight principally among rail and motor carriers with a strong reliance on the for-hire motor carrier for outbound shipments. This may confirm the findings of several studies which concluded that because many small shippers tender low and infrequent freight volumes, they frequently must pay premium transportation rates to insure offering of adequate levels of carrier service.[3] This may, in part, explain why nearly one in four small shippers ranked rates as "below average importance," "minimal importance," or "not important" in their carrier selection process (Table 2), whereas only one in seven of the combined medium and large shippers expressed similar ratings.

Carrier Selection Variables

Table 2 contains specific carrier selection factors and their importance ranking as based upon the frequency distribution of the respondent's rating per factor. Several service dimension ratings indicate significant distribution differences among the shipper classes and may be worthy of incorporation in the carrier's marketing program. For example, smaller-volume shippers appear to place a greater emphasis on such key service dimensions as direct, yet frequent, one-carrier service. In addition, they are concerned with the carrier's ability to expedite special shipments that frequently require standard equipment. On the other hand, large-volume shippers show little concern for frequent key-point service, LTL/LCL freight, and the carrier's ability to promptly settle loss and damage (L&D) claims. This may suggest that larger shippers generally ship commodities in large (TL/CL) quantities to and from more regional points with carriers possessing competitively better freight-claim records. However, as

[3]An excellent study that addresses itself in part to this point is Interstate Commerce Commission, Office of Policy and Analysis, *The Value of Motor Carrier Operating Rights* (Washington, D.C.: U.S. Government Printing Office, October 1979).

Table 2

DETERMINANTS OF CARRIER SELECTION
(In Percentages)

	Class I						Class II						Class III					
Factors[1]	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Frequency of key-point service	0.0	7.7	0.0	7.7	23.1	61.5	0.0	0.0	7.7	30.8	23.1	38.5	8.3	0.0	8.3	16.7	50.0	16.7
Door-to-door service	7.7	0.0	0.0	15.4	30.8	46.2	0.0	0.0	7.7	30.8	30.8	30.8	16.7	0.0	0.0	25.0	25.0	33.3
One-carrier service	0.0	0.0	0.0	23.1	38.5	38.5	0.0	7.7	15.4	23.1	30.8	23.1	0.0	0.0	8.3	16.7	25.0	50.0
LTL/LCL service	7.7	15.4	0.0	15.4	23.1	38.5	0.0	0.0	0.0	38.5	38.5	23.1	16.7	16.7	0.0	41.7	25.0	0.0
Expeditious handling of special shipments	0.0	0.0	7.7	0.0	38.5	53.8	0.0	0.0	0.0	38.5	23.1	38.5	0.0	8.3	16.7	0.0	41.7	33.3
Carrier transit time	7.7	0.0	0.0	23.1	30.8	38.5	0.0	0.0	0.0	23.1	46.2	30.8	0.0	0.0	8.3	16.7	50.0	25.0
Reliable transit time	0.0	0.0	7.7	15.4	30.8	46.2	0.0	0.0	0.0	23.1	53.8	23.1	0.0	0.0	8.3	8.3	33.3	50.0
Standard equipment availability	7.7	7.7	0.0	7.7	46.2	30.8	0.0	0.0	7.7	30.8	23.1	38.5	0.0	0.0	8.3	25.0	33.3	33.3
Special equipment availability	15.4	15.4	15.4	23.1	23.1	7.7	23.1	23.1	15.4	7.7	15.4	15.4	16.7	0.0	16.7	16.7	25.0	25.0
Rates	7.7	7.7	7.7	23.1	38.5	15.4	0.0	0.0	7.7	30.8	30.8	30.8	0.0	0.0	8.3	25.0	25.0	41.7
Carrier willingness to negotiate rates	23.1	15.4	0.0	7.7	30.8	23.1	7.7	7.7	7.7	38.5	15.4	23.1	0.0	25.0	16.7	8.3	8.3	41.7
Salesman competence	15.4	7.7	7.7	38.5	15.4	15.4	0.0	15.4	15.4	23.1	15.4	30.8	16.7	33.3	8.3	16.7	25.0	0.0
Information services	0.0	0.0	0.0	38.5	53.8	7.7	0.0	7.7	15.4	30.8	30.8	15.4	8.3	33.3	8.3	25.0	16.7	8.3
Shipment tracing	0.0	0.0	0.0	7.7	46.2	46.2	0.0	0.0	0.0	23.1	23.1	53.8	8.3	8.3	8.3	0.0	50.0	25.0
Freight damage	0.0	0.0	0.0	15.4	46.2	38.5	0.0	0.0	0.0	15.4	30.8	53.8	8.3	0.0	0.0	16.7	50.0	25.0
Promptness in settling freight claims	0.0	0.0	0.0	23.1	30.8	46.2	0.0	0.0	0.0	15.4	30.8	53.8	8.3	0.0	16.7	33.3	33.3	8.3

[1]Factor ratings: (1) not important; (2) minimal importance; (3) slightly below average importance; (4) slightly above average importance; (5) very important; (6) extremely important.

was the case of smaller shippers, expeditious handling of special shipments and reliable transit times are key service dimensions in the selection of for-hire carriers.

Informational Sources Consulted

In those instances where the service mix warrants adjustment, Table 3 indicates large-volume shippers stress past experience as a freight allocation tactic and deemphasize the role of the carrier's salesmen and printed materials. Although past experience is the important source for carrier selection or retention among all shippers, the response ratings suggest that small shippers are more inclined to resolve their transportation problems by examining printed materials, whereas middle-sized shippers are receptive to carrier sales representatives.

This revelation may have meaningful marketing impli-

Table 3

SOURCES OF INFORMATION SOUGHT BY SHIPPERS IN SELECTING CARRIERS
(In Percentages)

	Class I						Class II						Class III					
Factors	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Previous carrier experience	0.0	0.0	0.0	15.4	46.2	38.5	0.0	0.0	0.0	7.7	69.2	23.1	0.0	0.0	0.0	8.3	50.0	41.7
Other traffic managers	38.5	7.7	7.7	30.8	15.4	0.0	30.8	23.1	23.1	23.1	0.0	0.0	16.7	25.0	16.7	41.7	0.0	0.0
Local traffic clubs	53.8	7.7	15.4	0.0	23.1	0.0	38.5	7.7	23.1	30.8	0.0	0.0	41.7	41.7	0.0	16.7	0.0	0.0
Carrier salesmen	23.1	15.4	15.4	23.1	15.4	7.7	7.7	23.1	23.1	30.8	15.4	0.0	0.0	50.0	16.7	33.3	0.0	0.0
Industry periodicals	61.5	23.1	7.7	7.7	0.0	0.0	23.1	23.1	38.5	7.7	7.7	0.0	41.7	33.3	25.0	0.0	0.0	0.0
Trade catalogs	61.5	23.1	0.0	15.4	0.0	0.0	38.5	23.1	38.5	0.0	0.0	0.0	50.0	41.7	8.3	0.0	0.0	0.0

cations, particularly in those instances where shippers frequently assess the performance levels of the carriers within their transportation mix. Table 4 presents data on both the transportation selection and evaluation policies of shippers as well as the frequency of carrier performance evaluations. As can be seen, the larger the shipper firm, the more apt it is to have a formal carrier selection policy. Probably more important are the figures that indicate the formality of carrier performance evaluation and the frequency of conducting these evaluations. At first glance it may seem somewhat surprising that small-volume shippers exceed moderate-volume shippers in formally evaluating the performance levels of the carriers in their transportation mix. However, this finding should not be surprising, given the vulnerability of small shippers to logistical aberrations. As an illustration, consider the following: Due to capital constraints, many small shippers are unable to maintain adequate (inbound) safety stock reserves, and there exists the real possibility of inventory stockouts (due to transit delays) which can have (negative) multiplier impacts on the firm's working capital. As a result of this vulnerability, many small shippers may be forced to formally evaluate carrier performance levels and may, in fact, adjust their transportation mix more frequently than their larger counterparts. However, this may be a mute point, given the simple fact that large-volume carriers are inclined to conduct more periodic performance evaluations (e.g., daily) vis-a-vis their smaller-volume counterparts.

Table 4

SHIPPER SELECTION AND EVALUATION PROGRAMS
(In Percentages)

Class	Shippers Formally Selecting Carriers	Shippers Formally Evaluating Carriers	Frequency of Evaluating Carrier Performance[1]		
			Daily	Weekly	Monthly
I	38.5	61.5	7.7	15.4	38.5
II	53.8	53.8	30.7	0.0	23.1
III	66.7	83.3	41.7	8.3	33.3

[1]The frequency figures are disaggregates of the percentage figures cited in the "shippers formally evaluating carriers" column.

Carrier Marketing Implications

The findings strongly suggest a reexamination on the behalf of carrier managements to consider segmenting their marketing efforts. Without question, market segmentation strategies are gaining increasing support from transportation specialists.[4] Segmentation schemes potentially offer the carrier a decision-making tool that can not only differentiate market segments (shippers) by service requisites but permit a more effective allocation of carrier marketing resources as well. It is therefore the author's position that any carrier marketing strategy that identifies all users of transportation as a homogeneous group, particularly where shipper segments clearly exist, is at best a suboptimizing managerial policy.

Based upon what has been previously developed, the following recommendations are offered as a marketing alternative. For large-volume shippers, it is suggested that carriers emphasize in their promotional efforts the ability to provide reliable service, particularly such factors as expediting special shipments, consistent transit times, and delay notifications; and the ability to accommodate frequent TL/CL shipments destined to many domestic points. Inasmuch as previous experience takes precedence over other promotional/sales efforts, the role of the carrier salesman assigned to large shippers should be that of a monitoring agent measuring shipper satisfaction levels as a tool for reinforcing current service levels and identifying potential freight opportunities where the competition has faltered.

Small-volume shippers warrant some overlap in the carrier's marketing efforts, although the findings suggest a clear delineation among certain service dimensions. The carrier's emphasis here should be on the availability of its equipment, particularly standard units, capable of providing frequent, direct key-point service that is both flexible and reliable. Additional dimensions would necessarily include the expeditious handling of special shipments with provisions for tracing upon request. A more aggressive salesman role is recommended, particularly in differentiating one's inherent service advantages vis-a-vis competing carriers and modes on inbound shipments and carriers on outbound freight. The distribution or referral to informative materials is also recommended, given the small-volume shipper's apparent receptivity to printed literature as an informational source to service-mix resolution.

Middle-volume shippers tend to demonstrate a more diverse modal split and greater balance in their ratings among all service dimensions. This suggests that the traditional aggregate approach for carrier marketing may be an appropriate strategy. However, the most promising finding that clearly differentiates middle-volume shippers from their counterparts is their apparent willingness to converse with carrier sales representatives. Given the highly competitive nature of this market segment, carrier salesmen should intensively market the firm's service capabilities, with particular emphasis directed to such factors as the comparative stability of rates over time, documentation of freight-damage claims, endorsements from consignees, and the more conventional factors of service frequency and tracing.

[4]For example, see Michael A. McGinnis, "Segmenting Freight Markets," *Transportation Journal* 18, no. 1 (Fall 1978), pp. 58-68; Robert A. Robicheaux and Ernest R. Cadotte, "Segmenting Common Motor Carrier Markets on the Basis of Customer Satisfaction," *Transportation Research Forum Proceedings* 19, no. 1 (1978), pp. 331-38; and Peter Watson, James Hartwig, and William E. Linton, "Factors Influencing Shipping Mode Choice for Intercity Freight: A Disaggregate Approach," *Transportation Research Forum Proceedings* 15, no. 1 (1974), pp. 138-44.

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TAX INTEGRATION AND CORPORATE EARNINGS RETENTION

*Dennis P. Zocco**

Integration of the personal and corporate income taxes has been a controversial issue since the early stages of our modern tax structure. Over the years, several methods of integrating the two taxes have been proposed.[1] Some even survived the legislative gauntlet and were enacted into law. One method which has not as yet won complete acceptance of the legislatures but is steadily gaining ground is the Canadian Carter Commission Plan to facilitate complete integration of the two income taxes.[2] This plan employs a combination of the partnership and withholding mechanisms which, in terms of its financial effects and administrative feasibility, is recognized as the most positive proposal to date for achieving full integration.

One facet of the withholding mechanism which is of considerable importance to financial managers is that it places an upper limit on the percentage of earnings available for retention. If, in fact, the withholding rate were set equal to 70 percent, the highest marginal tax rate applicable to dividend income, then internal financing would be limited to a maximum of 30 percent of earnings. Financing in excess of that would have to be done externally.[3]

In light of the increasing congressional acceptance of full integration and the increasing probability of its enactment in some form,[4] this paper investigates the potential impact of a withholding plan on the retention abilities of corporations in the southern region of the United States. The first section details the mechanics of a full-integration plan of the withholding type. The second section provides an interindustry analysis of the impact of this plan on the financing decisions of corporations located in the South. Finally, the conclusions and implications of the study are presented in the third section.

Tax Integration: The Carter Commission Plan

Over the years, two schools of thought have emerged regarding the taxation of corporate income. The "separatist" view maintains that the corporation is a distinct economic entity, separate in its taxable status from its stockholders. Therefore, the current practice of taxing corporate income both at the corporate level and again at the personal level when distributed as dividends is justified and reasonable.[5]

The opposing view is that of the "integrationist," who maintains that the corporation is a "legalized" aggregate of its stockholders and merely serves as a conduit through which income earned by the corporation is either retained or passed on to stockholders as dividends. According to this view corporate income is, in fact, personal income and there is no justification in taxing them separately.[6]

The current tax structure in the United States indicates legislative acceptance of the separatist view. However, the

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[1]For a historical perspective on integration attempts and a detailed description of various partial- and full-integration plans, see George F. Break and Joseph A. Pechman, *Federal Tax Reform: The Impossible Dream?* (Washington, D.C.: The Brookings Institution, 1975), chap. 4; and James R. Haney, "Integration of the Corporate and Individual Income Taxes," *National Tax Journal*, September 1977, pp. 345-58.

[2]See *The Report of the Royal Commission on Taxation* (Ottawa: Queen's Pointer, 1966).

[3]Several recent studies have investigated the effect of a high withholding rate on corporate retention. Surrey has stated that if the withholding rate were to be set at 70 percent (leaving a maximum of 30 percent of earnings available for internal financing), corporate financial managers would feel that the withholding mechanism places an undue burden on their earnings retention capabilities. Holland has contended that a 70 percent withholding rate would not pose a serious problem since "presently the corporation tax 'draws' out 50 percent of after-tax corporate profits." Empirically, Schwartz and Aronson have shown that during the 1961-70 period, overall corporate retained earnings as a percentage of before-tax profits was 29.3 percent. They concluded that the corporate sector would not have a difficult time adjusting to a withholding rate of 70 percent. See Stanley S. Surrey, "Reflections on 'Integration' of the Corporation and Individual Income Taxes," *National Tax Journal* 28 (September 1975), pp. 335-40; Daniel M. Holland, "Some Observations on Full Integration," *National Tax Journal* 28 (September 1975), pp. 353-57; Eli Schwartz and J. Richard Aronson, "How to Integrate Corporate and Personal Taxation," *Journal of Finance*, December 1972, pp. 1073-80.

[4]In 1976, then Secretary of the Treasury William Simon presented a stepwise proposal to Congress which would have completely integrated the two taxes. In 1977, a similar proposal for full integration was submitted to Congress by the Treasury Department as one of the final acts of the Ford administration. One year later, when President Carter failed to consider the integration issue in his tax reform package, Chairman Al Ullman of the House Ways and Means Committee proposed that a partial-integration plan be implemented.

[5]See Richard A. Slitor, "The Corporations Income Tax: A Re-Evaluation," *National Tax Journal*, December 1952, pp. 289-309; Gerhard Colm, "The Corporation and the Corporation Income Tax in the American Economy," *American Economic Review*, May 1954, pp. 486-501; Richard Goode, *The Corporation Income Tax* (New York: John Wiley & Sons, Inc., 1951).

[6]See Charles McLure, Jr., "Integration of the Personal and Corporate Income Taxes; The Missing Element in Recent Tax Reform Proposals," *Harvard Law Review* 88 (1975), pp. 536-37; R. Musgrave and P. Musgrave, *Public Finance in Theory and Practice* (New York: McGraw-Hill Book Company, 1973), pp. 272-73.

recent wave of tax reform has revived interest in eliminating the economic and financial distortions resulting from the separate tax treatment of corporate and personal income by integrating the two taxes. One method of achieving full integration which has had growing acceptance in recent years is a withholding plan recommended by the Carter Commission.

Under this plan, the corporation would withhold a certain percentage of the stockholder's imputed corporate income in order to meet his tax liability on income accruing to him through the corporation. In order to administratively facilitate the withholding scheme, the withholding rate would be equal to the highest marginal personal tax rate and applied to the entire amount of corporate income, whether distributed or not. Stockholders would include their imputed share of corporate income with their other taxable income and apply the withheld amount against their total tax liability. Any excess withholdings would be refunded to the stockholders.

A comparison of the mechanics of our current taxing system and the withholding plan is illustrated in Table 1. Under our current system (assuming a corporate tax rate of 50 percent), a stockholder with $100 of imputed corporate income has $50 taxed away at the corporate level. He is then taxed at the personal level on any dividends distributed. In the example, with all after-tax earnings being distributed, the stockholder in a 30 percent tax bracket has an additional $15 in taxes to pay. His total tax liability amounts to $65 on imputed income of $100, or an effective net tax burden of 65 percent. As is shown, the net tax burdens on individuals in the 50 and 70 percent tax brackets are 75 and 85 percent, respectively.[7]

Table 1
STOCKHOLDER NET TAX BURDEN UNDER ALTERNATIVE SYSTEMS

	Personal Tax Rate		
	30%	50%	70%
Current Dual Tax Structure			
Imputed income	$100	$100	$100
Corporate income tax (50%)	50	50	50
Dividend distribution	50	50	50
Personal tax on dividends	15	25	35
Total tax liability	$ 65	$ 75	$ 85
Net tax burden	65%	75%	85%
Tax Integration Withholding Plan			
Imputed income	$100	$100	$100
Withholding at 70%	70	70	70
Personal tax liability	30	50	70
Tax credit	40	20	0
Net tax liability	$ 30	$ 50	$ 70
Net tax burden	30%	50%	70%

Under the withholding plan, the same individual in the 30 percent tax bracket would have $70 withheld to satisfy his personal tax liability on the $100 of imputed corporate income. However, since his personal tax liability is only $30, he receives a $40 tax credit or refund. Therefore, his net tax liability is $30, which amounts to a net tax burden of 30 percent. The withholding plan also results in stockholders in the 50 and 70 percent tax brackets having net tax burdens of 50 and 70 percent, respectively.

Although the withholding plan eliminates the extra tax burden on corporate income, there is an aspect of the procedure which could affect the financing decisions of financial managers. Since the withholding rate would most likely be set at 70 percent (to match the highest marginal tax rate on personal income), internal financing capabilities would be limited to 30 percent of earnings. Firms which have been retaining over 30 percent of pretax earnings would be forced into the capital markets for funds in order to maintain their overall financing levels.

With the recent uncertainty in capital market conditions in terms of both cost and availability of funds, the increased dependence on external financing would alter the risk structure of the firms affected and potentially impede both short- and long-term growth. The next section investigates the potential impact of a withholding plan on the internal financing capabilities of firms in the southern region of the United States.

Empirical Analysis of Corporate Earnings Retention

Under a full-integration plan of the withholding type, the most likely withholding rate would be the equivalent of the highest marginal tax rate to which dividends are subject. Given our current rate structure, this rate would be 70 percent. Therefore, firms which currently retain in excess of 30 percent of pretax earnings would most likely be affected to the greatest degree by a withholding plan.

Table 2 shows the average retention rates for firms in twelve industry categories and located in the southern region of the United States.[8] The time period investigated was 1969 to 1978. Financial data were extracted from Standard and Poor's Industrial Compustat Tapes. In all, 163 corporations were included in the southern sample and 1,037 corporations were included in the national sample.

For the "all industries" category of the southern sample, average corporate retention rates were higher than 30 percent in the last seven years of the period. Furthermore, in each year of the period, average retention rates for the southern region were higher than the national average. This indicates that corporations residing in the South have been financing internally to a much

[7]This demonstrates the regressive nature of our current policy of taxing personal and corporate income under different rate structures.

[8]States represented in the sample are Alabama, Florida, Georgia, Maryland, Mississippi, North Carolina, South Carolina, and Virginia. Bureau of Census regional guidelines were used to determine regional classifications.

Table 2
CORPORATE RETENTION RATES[1]
SOUTHERN REGION AND UNITED STATES
(1969-1978)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Industries: South										
Food products (8)[2]	27.6	29.8	30.6	33.0	33.8	36.1	37.4	36.6	36.4	36.2
Textile mill products (33)	24.1	25.2	25.0	31.1	34.6	33.6	29.8	36.6	35.4	34.9
Lumber and wood products (5)	29.6	28.0	31.2	36.8	36.0	36.0	38.4	38.5	39.8	38.8
Chemicals (7)	24.8	21.1	22.5	29.4	38.7	40.3	37.6	39.3	31.4	32.6
Metal products (5)	30.7	36.6	43.6	44.3	44.4	43.9	42.5	47.2	41.3	46.4
Industrial machinery (12)	32.3	31.8	31.9	35.6	39.7	37.8	36.3	38.2	36.8	40.2
Electronic equipment (14)	36.2	35.1	35.5	37.7	38.2	40.6	41.3	41.8	40.3	42.2
Transportation equipment (7)	36.5	40.1	42.3	47.5	50.5	46.9	51.7	50.0	45.9	44.1
Transportation services (17)	26.4	29.5	34.6	41.5	38.2	42.6	42.5	48.9	49.5	51.3
Communications (9)	14.3	16.2	17.5	19.8	20.9	19.0	16.2	22.1	22.4	22.8
Wholesale trade (11)	35.4	35.1	36.1	39.5	40.4	39.3	32.9	32.4	34.0	35.5
Retail trade (35)	30.2	31.6	35.9	39.1	38.9	38.0	39.1	39.6	40.6	40.3
All industries: South	27.3	27.8	30.0	34.6	36.6	37.0	35.4	38.2	36.8	37.3
All industries: U.S.	23.3	21.7	26.3	29.6	32.1	31.8	31.8	33.8	33.2	33.9

[1]Retained earnings as a percentage of before-tax earnings.

[2]Numbers in parentheses are numbers of firms in industry sample.

greater extent than corporations nationally. Moreover, corporations in the South would be more significantly affected by a withholding plan which limits retained earnings to 30 percent.

On an individual industry basis, those classifications which showed the highest retention rates (some years in excess of 50 percent) were metal products, industrial machinery, electronic equipment, transportation equipment, transportation services, and retail trade. Only the communications industry demonstrated retention rates consistently lower than the 30 percent level.

Since only corporations with retention rates higher than 30 percent would be forced into the capital markets in order to maintain preintegration levels of financing, subsamples of the regional industry samples were constructed to include only the corporations with rates exceeding the upper limit.[9] Table 3 illustrates the degree of supplemental external financing which would have been required by these corporations under a 70 percent withholding plan.

The first figure for each classification indicates the percentage of preintegration retained earnings that would be "cut off" by the upper limit placed on the retention rate. The second figure represents the dollar amount of additional external financing in each year which would have been necessary to maintain total financing.

For the "all industries: South" subsample, the reduction in retained earnings under a withholding plan would have ranged from 26.6 to 31.8 percent during the period. In all years, the percentages for the South were higher than those for the U.S. subsample, indicating that firms located in the South would have a greater postintegration dependence on capital markets than firms on a national basis. Those individual industries which show the highest potential reductions in internal financing are metal products, transportation equipment, and transportation services. Industries least affected would be food products, chemicals, and communications.

In terms of actual supplemental external financing requirements, corporations in the "all industries: South" subsample would have had to tap the capital markets in 1978 for a total of $617.3 million. This amounted to 12.8 percent of the requirements of $4,830.8 million for the U.S. subsample. In terms of the total corporate financing registered with the SEC, in 1978 all corporations raised $46.6 billion through the issue of debt, common stock, and preferred stock.[10] For the corporations in Table 3, supplemental external financing resulting from the withholding mechanism represents 13.5 percent of the gross financing proceeds in 1978.

Conclusions and Implications

One of the problems inherent in basing tax policy decisions on national or even regional averages is that of considering all entities affected as average. In the debate on whether the withholding mechanism is a viable method for achieving full integration, legislators will most likely consider the national averages for retention rates. As was shown in Table 2, rates for the national sample were fairly close to the 30 percent upper limit,

[9]This screening process reduced the regional sample from 163 corporations to 133 and the national sample from 1,037 to 810. This represents only an 18 percent and a 22 percent reduction in the regional and national samples, respectively.

[10]U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*.

Table 2
SUPPLEMENTAL EXTERNAL FINANCING UNDER WITHHOLDING PLAN
SOUTHERN REGION AND UNITED STATES
(1969-1978)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Industries: South										
Food products	26.8[a]	42.2	42.2	10.3	16.5	18.3	19.9	19.5	21.0	18.2
	(1.3)[b]	(1.6)	(2.0)	(4.5)	(10.6)	(12.5)	(17.4)	(20.9)	(24.2)	(23.5)
Textile mill products	20.2	16.0	20.1	24.8	21.6	14.4	23.0	22.6	19.3	20.8
	(8.2)	(6.8)	(14.7)	(25.9)	(37.0)	(32.6)	(32.5)	(66.7)	(57.4)	(55.7)
Lumber and wood products	21.5	17.1	21.6	28.0	27.2	24.7	21.8	25.0	24.6	24.8
	(1.3)	(1.7)	(2.3)	(4.5)	(5.1)	(4.6)	(4.0)	(6.8)	(8.6)	(9.2)
Chemicals	35.2	37.3	38.6	37.8	28.7	30.0	26.2	30.6	11.2	12.0
	(4.9)	(7.2)	(7.9)	(8.9)	(58.0)	(88.5)	(72.5)	(93.2)	(24.7)	(27.7)
Metal products	16.8	18.2	31.2	32.3	32.5	31.7	36.5	36.9	39.1	36.3
	(0.7)	(1.1)	(3.0)	(5.2)	(5.5)	(7.3)	(5.3)	(5.2)	(6.3)	(13.3)
Industrial machinery	34.4	34.3	45.0	43.5	24.4	21.2	49.4	21.8	20.1	25.4
	(5.0)	(3.1)	(3.6)	(6.4)	(10.5)	(10.3)	(8.1)	(10.7)	(11.2)	(21.5)
Electronic equipment	22.3	20.6	22.4	32.4	27.3	32.0	33.6	32.1	25.8	29.0
	(12.0)	(8.9)	(9.0)	(13.5)	(16.2)	(22.9)	(26.4)	(34.0)	(37.9)	(58.2)
Transportation equipment	32.1	35.6	38.2	36.8	40.7	36.2	42.2	40.1	34.7	32.0
	(36.5)	(31.3)	(36.9)	(59.4)	(77.5)	(73.8)	(75.8)	(97.5)	(98.6)	(82.2)
Transportation services	29.4	39.6	39.6	31.7	30.5	29.7	31.2	38.8	39.4	41.5
	(10.8)	(19.3)	(19.5)	(45.9)	(39.2)	(82.4)	(59.3)	(120.7)	(142.3)	(188.2)
Communications	31.0	34.9	28.5	19.5	31.0	29.4	28.5	25.5	21.4	18.6
	(4.4)	(8.3)	(7.6)	(12.5)	(13.2)	(14.5)	(14.6)	(15.1)	(11.0)	(11.8)
Wholesale trade	27.9	31.3	30.0	35.7	28.3	26.0	13.2	13.8	24.3	29.6
	(6.7)	(7.0)	(8.9)	(13.9)	(16.3)	(21.5)	(6.3)	(5.3)	(8.5)	(17.1)
Retail trade	30.5	33.0	34.0	30.9	30.8	28.9	23.6	24.8	26.4	26.0
	(21.6)	(22.7)	(32.4)	(46.6)	(52.2)	(46.6)	(57.5)	(71.5)	(94.9)	(108.2)
All industries: South	28.5	30.9	31.8	30.1	29.3	27.4	28.2	29.7	26.6	27.6
	(114.0)	(119.6)	(148.3)	(247.7)	(341.7)	(417.9)	(380.3)	(548.3)	(526.2)	(617.3)
All industries: U.S.	23.6	24.3	22.2	24.4	25.4	27.2	26.3	27.2	25.2	24.4
	(576.8)	(550.5)	(819.2)	(1,582.2)	(2,409.3)	(2,832.2)	(2,823.7)	(4,089.7)	(4,237.6)	(4,830.8)

[a] Supplemental external financing measured as the percentage of preintegration retained earnings in excess of upper limit established by 70 percent withholding rate.

[b] Dollar amount of supplemental external financing as defined above (in millions of dollars).

indicating that firms would find little difficulty adjusting to a slightly lower rate.

However, when the analysis is extended to a regional and interindustry basis, Table 2 also demonstrates that the South as a whole will bear a high burden from this plan and key industries within the southern region will bear a significantly higher burden in terms of a limitation on their internal financing capabilities.

One method of alleviating the potential financing problems brought on by this plan is to set the withholding rate at 50 percent. This, in effect, would place corporations in the same position as before integration, since the current corporation income tax takes approximately 50 percent of earnings from corporations. Stockholders in tax brackets in excess of 50 percent would have to supplement withholding with their own cash. This might cause a liquidity problem for some of those stockholders, but it would be a small price to pay for the effective elimination of the ceiling on corporate retention.

THE ISSUE OF LEGAL PROTECTION FOR COMPUTER SOFTWARE PROGRAMS

*Paul Lansing and Emily A. Gillula**

Introduction

Since the mid-1960s and the advent of the computer into American society, a problem has been growing as the computer industry develops. That problem is legal protection of computer software, the collection of computer programs used to direct and control the operations of computers to complete the tasks they are designed to perform. With increasingly more time and money being put into programming activity, software firms and individual programmers see a great need to protect their wares from theft and unauthorized use. " 'A computer program is as much an intellectual property as anything else,' said computer scientist and author, Dan McCracken, 'and a guy who's slaved over a program for a year or more has the right to protect it.' "[1] Unfortunately, this need for protection is not easily satiated. Disagreement lies within and without the computer industry regarding the issue. Debates on the subject have appeared in law, computer science, information science, and government literature.[2]

The situation is complicated by varying views of what a computer program is, why protection is needed, and what forms that protection should take. Three major mechanisms are presently used—patent, copyright, and trade secrecy—in a sporadic way throughout the industry with inconsistent success. The following is an attempt to outline the issues involved with legal protection of computer software, commenting on the methods which have been used and some recommendations for revision of present practices.

Computer Software and the Need to Protect

Before an item can be afforded protection, there must be a clear understanding of what is being protected. In the computer industry, the definition of the item will largely determine the type of protection given. A major issue in the controversy for protection of computer software lies in how "program," "software," and related terms are to be defined. However, the task of defining these terms is not an easy one.

First, the process which surrounds the development of the software must be understood. Simply stated, a problem or situation exists, and to analyze it a computer is used which can receive, transmit, and store vast quantities of information or data. There is a distinction between *hardware*—the physical equipment consisting of machine, Central Processing Unit (CPU), disks, magnetic tape, electrical circuits, etc. —and the *software*. Software has been defined as "the collection of all programs for a computer."[3] The question remains, How should the term "program" be defined?

When looking at the many and varied phrases that have been uttered in response to this question, one is tempted to revert back to the days of the abacus and slide rule. The following is a sample list of definitions of "program" found in the literature:

A set of instructions which tell the computer how to do its work[4]

A fixation of a series of statements or instructions to be used in conjunction with a computer to bring about a certain result[5]

A plan for the automatic solution of a problem[6]

A group of related routines which solve a given problem[7]

A machine part or completion of an incomplete machine

A circuit diagram or blueprint for a circuit board

An ordered set of data that are coded instructions[8]

A coded writing, a pattern of symbols, or nonsense writing

Regardless of the definition assigned, the process by which a program is developed, used, and stored is relatively standard, and through this process three classes of programs emerge: the source program, the assembly program, and the object program.

After the problem is formulated and outlined, the

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[1]Edith D. Myers, "Should Software Be Copyrighted?" *Datamation* 24 (March 1978): 128.

[2]For an excellent bibliography covering the discussion of legal protection of software for the years 1958 to 1978, see Robert O. Nimtz, "Development of the Law of Computer Software Protection," *Journal of the Patent Office Society* 61, no. 1 (January 1979): 26-43.

[3]C. L. Meek, *Glossary of Computing Technology* (New York: CCM Information Corp., 1972), p. 210.

[4]R. Fleck and C. Honess, *Data Processing and Computers* 437 (1978), cited by Michael C. Gemignani, "Legal Protection for Computer Software: The View from '79," *Rutgers Journal of Computers, Technology and the Law* 7, no. 2 (1980): 271.

[5]Janet K. R. Kuhn and Leslie D. Ball, "Protecting Software with Copyrights, Patents and Trade Secrets," *Journal of Systems Management* 29 (December 1978): 29.

[6]Charles J. Sippl and Charles P. Sippl, *Computer Dictionary and Handbook*, 2d ed. (Indianapolis: Howard W. Sans & Co., 1972), p. 333.

[7]Meek, p. 175.

[8]Gemignani, p. 280.

programmer usually applies an algorithm, a statement of the steps to be followed in the solution of a problem. The algorithm is a fixed step-by-step procedure for accomplishing a given result.[9] It may be expressed as a flow chart, which is then coded and written into a computer language, such as COBOL, BASIC, FORTRAN, etc. This is known as the source program. It is a list of statements and instructions which are understandable by both the human programmer and the computer machinery. A compiler translates the source program into machine language; the result is an assembly program. The assembly program moves to the object program, which actuates the switches to control the electrical impulses for the computer's processing of the data toward solution.

The above outline is oversimplified, because the program may consist of a few to thousands of statements. Groups of programs form operating systems, controlling the general operation of the hardware, and applications systems, which are designed for particular jobs and problems. There has also been an increase in firmware, hard-wired representations of computer commands. The complexities of the situation make it difficult to respond to the question, What is *the* program? Whether it is viewed as an idea, a scientific principle, a process, a machine part, an instruction manual, a code, or a circuit diagram greatly affects the type of protection the program is afforded. For instance, some view a program as an electrical work and part of a machine and argue against copyrightability, while others say that a program is a particular form of human expression which should be copyrightable. Further arguments will be discovered as each of the protective measures used by the computer industry is discussed in more detail.

Another debatable question is, Why should or shouldn't protection be given to computer software? Again, the responses are diverse. The Computer and Business Equipment Manufacturers Association (CBEMA) has stated that "formal protection is needed to encourage the creation and distribution of computer programs in a competitive market."[10] Increased protection may reward successful initiative. As increasingly complex and expressive programs are designed, financial support could be insufficient to develop all programs without adequate protection. Counter to these statements, some say that increased protection would inhibit growth of the industry, because larger firms would freeze out smaller companies by tying up concepts. There exists a threat of additional costs coupled with time delays in seeking protection. Besides, the software industry has been expanding very well within the present framework of protection.

Between the hardware and software industries the disagreement is highly accentuated to the point of competing interests. Operating systems programs are developed more by the hardware industry, and it has tended to favor copyright protection, with allowances to follow other methods, dependent upon the type of protection needed. The software industry, however, is dissatisfied with the status quo. Part of the reason for its concern is the tremendous growth in software now occurring, a rate of 14.4 percent per year. It has been predicted that software will have the largest share of the computerware market in the 1980s; manufacturers and suppliers of software are forecast to have sales of $1.45 billion in 1980. A mechanism of control industrywide to provide efficient and effective utilization of programmer expertise is lacking, especially as the responsibility for software distribution divides between the hardware industry, software houses, and individual users. Although members of the software industry have expressed interest mostly in patent protection, recent studies point to differing, somewhat surprising, opinions.

At the request of the National Commission of New Technological Uses of Copyrighted Works (CONTU), Harbridge House, a management consultant, polled computer software industrial executives whose organizations belonged to the Association of Data Processing Service Organizations (ADAPSO). According to the resulting report of November 18, 1977:

> The singular outstanding conclusion of [the] survey was that the ability to protect legal interests in software through a grant of limited monopoly is a matter of monumental insignificance to the industry. . . . [Software developers] are not at all convinced that legal protection is necessary and feel that it is generally ineffective even when invoked, although these perceptions change as a company gets larger, particularly if it produces general business or system software programs.[11]

Table 1 shows the results of this survey, indicating methods and effectiveness of software protection. Another study performed content analysis of journal articles for favorable, neutral, and unfavorable reactions to increased protection. "The raw scores show that a majority of authors and/or editorial screening boards are favorable to the concept of increased protection for computer software."[12]

Perhaps the dichotomy in feelings toward the need for protection is best summed up in the following statement: "A firm's hardware can be bolted to the floor to prevent theft, but software—like a clone—has the capability of being reproduced with no degradation of the original system."[13] Therefore, the necessity for software protection is unique, and attempts to fit it into existing legal

[9]Meek, p. 7.

[10]Myers, p. 132.

[11]Robert Bigelow, "Legal Protection of Software: A Matter of Monumental Insignificance?" in Robert Bigelow, ed., *Computer Law Service*, vol. 3: *Articles* (Wilmette, Ill.: Callaghan & Co., 1972-80), p. 119.

[12]Ibid., p. 120.

[13]Kuhn and Ball, p. 28.

MID-SOUTH ECONOMY

BUREAU OF BUSINESS & ECONOMIC RESEARCH THE FOGELMAN COLLEGE OF BUSINESS AND ECONOMICS MEMPHIS STATE UNIVERSITY

STATISTICAL SUPPLEMENT

MID-SOUTH ECONOMY

The Mid-South economy grew slowly in the first quarter of 1981. First-quarter personal income is not available. In the latest month for which data are available, the Mid-South increase matched the national increase of 13.3 percent because Louisiana shared in the oil boom, increasing personal income 18.9 percent over the year. None of the other regional states matched the United States growth.

Civilian Labor Force and Unemployment

Growth from a year earlier was 1.4 percent in the national civilian labor force in January. The growth in Louisiana was three times that amount. In Alabama and Mississippi growth was only slightly higher than the United States growth rate, while Arkansas and Tennessee had lower rates of increase. The unemployment rate increased over a percentage point in the nation and in all the regional states except Louisiana. In spite of the large increase in the civilian labor force in Louisiana, the state had the lowest unemployment rate in the region—7.1 percent. The other four states had unemployment rates ranging from 8.6 percent in Mississippi to 9.3 percent in Alabama, all higher than the 8.2 percent national rate.

Non-Agricultural Employment

A decline from a year earlier continued in manufacturing employment in the United States and in Alabama, Arkansas, Mississippi, and Tennessee. Investments in petroleum contributed to a 3.0 percent increase in manufacturing employment in Louisiana. Non-manufacturing employment ranged from a 0.9 percent increase in Mississippi to a 4.6 percent increase in Louisiana. Tennessee was the only Mid-South state sustaining a decrease.

Earnings

Average weekly earnings of $308.43 in the nation was an increase of 11.3 percent from the year before. Louisiana had not only a higher average but a greater increase of 12.7 percent. Tennessee had an increase of 12.4 percent, also higher than that of the United States as a whole. Alabama, Arkansas, and Mississippi had increases of 7.9 percent, 9.5 percent, and 9.6 percent, respectively. Those three states had declines in the average weekly hours which partly accounted for the lower increase in average earnings.

Construction

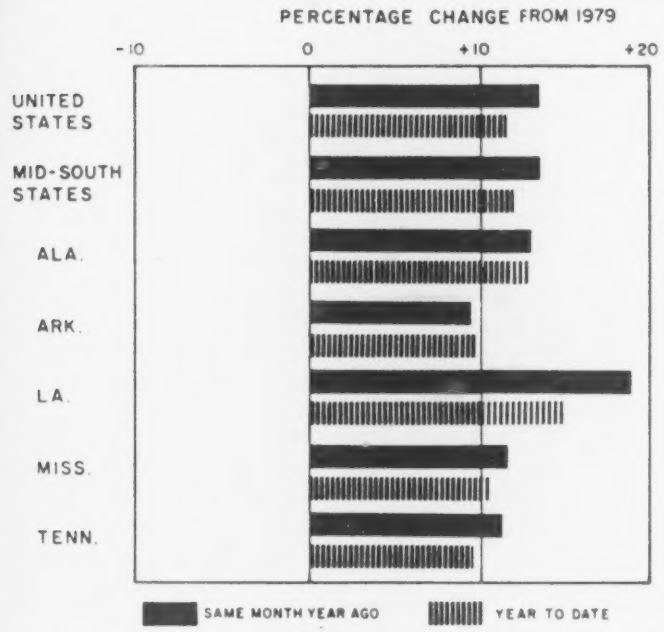
Total construction contracts awarded in the nation increased 2.2 percent in February from a year ago. The two-month total was only 1.7 percent higher. Large increases for January and February were made in Arkansas, Mississippi, and Tennessee. Louisiana had a decline from a year ago.

Total building construction contracts in the United States were 5.6 percent above February 1980 and 7.6 percent higher for the two months. The Mid-South had a small increase for February, 1.0 percent, but had a 7.8 percent increase for the two months. Only Louisiana had a decrease in February and for the two-month period. The other Mid-South states had increases in February that outpaced the inflation rate. Residential building awards fell 3.6 percent in February from last year in the nation. The regional states all had increases ranging from 5.7 percent in Tennessee to 29.7 percent in Mississippi. Nonresidential building awards in February a 17.2 percent increase in the United States but had a 12.1 percent decline in the Mid-South. Large relative increases in Arkansas and Tennessee failed to offset declines in Louisiana and Mississippi.

Total dwelling unit starts increased 3.7 percent in the United States during the first two months. The region had a 1.0 percent decline due to a large decrease in Tennessee. The other three states had gains that were greater than that of the nation.

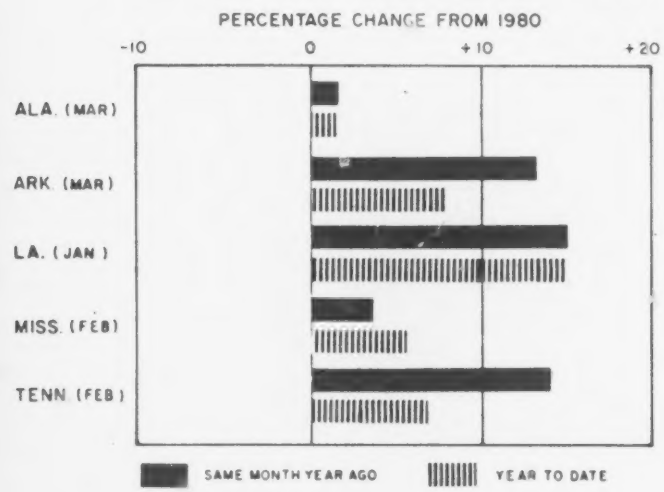
Public works and utilities construction contract awards declined 9.4 percent in February and 16.1 percent for the two months in the nation from the same periods in 1980. The four regional states had increases for the January-February period ranging from 13.9 percent in Tennessee to 141.1 percent in Arkansas.

PERSONAL INCOME - DEC., 1980

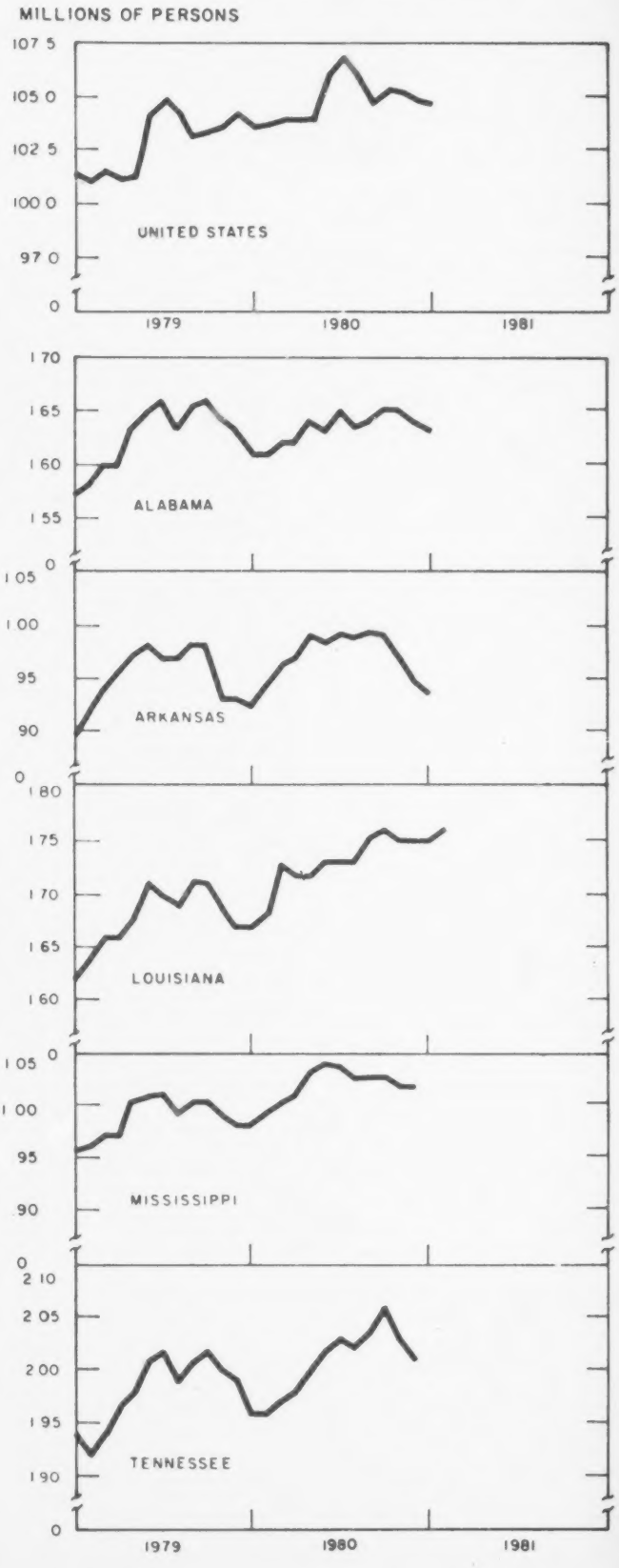


SOURCE BUSINESS WEEK, APRIL 13, 1981

SALES TAX COLLECTIONS 1981



CIVILIAN LABOR FORCE



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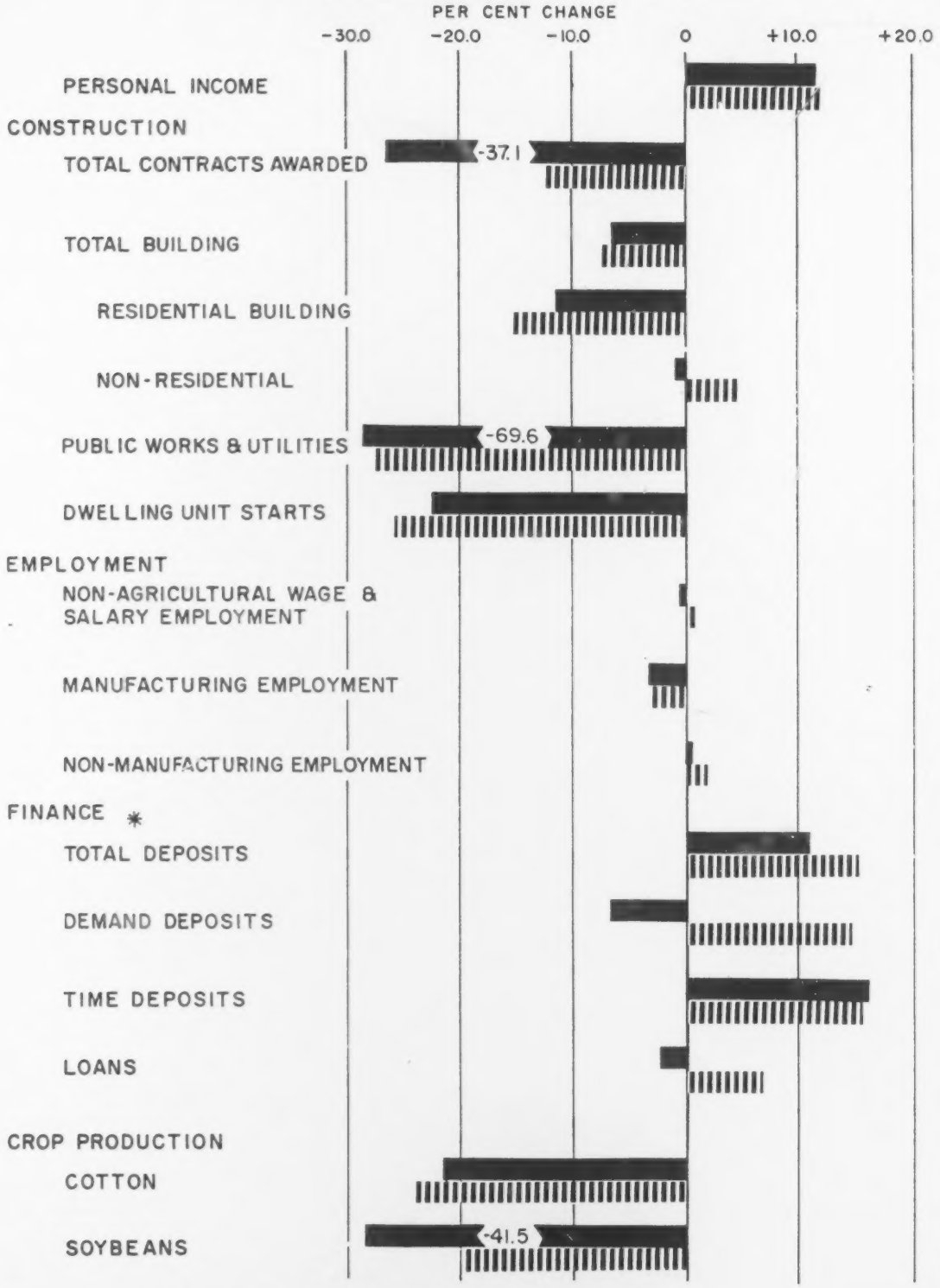
THE MID-SOUTH ECONOMY AND U.S. ECONOMY
1980 COMPARED WITH 1979



* MID-SOUTH DATA ARE FOR MEMBER BANKS IN ARKANSAS, NORTH MISSISSIPPI, AND WEST TENNESSEE. U.S. DATA ARE FOR ALL DOMESTICALLY CHARTERED COMMERCIAL BANKS EXCEPT FOR BRANCHES OF FOREIGN BANKS.

SOURCES: BUSINESS WEEK; DODGE REPORTS; SURVEY OF CURRENT BUSINESS; STATE EMPLOYMENT SERVICES; MEMBER BANKS OF FEDERAL RESERVE SYSTEM; STATISTICAL REPORTING SERVICE OF U.S. DEPT. OF AGRICULTURE.

ANALYSIS OF ANNUAL CHANGES IN THE MID-SOUTH ECONOMY 1980

The United States economy in 1980 was disastrous. Higher OPEC prices for oil contributed to high inflation rates in the first quarter. Interest rates were high but slipped dramatically to last summer's low. Residential builders were encouraged by the lower rates. The rate of inflation, which had declined, started to rise again. This caused the Federal Reserve to again tighten growth of the money supply, causing interest rates to return to high levels.

Table 1

PERSONAL INCOME

Area	Personal Income (millions) December 1980	Personal Income (millions) Total 1980	Percent Change from December 1979	Percent Change from Total 1979
United States	$195,290	$2,151,149	+13.3	+11.4
Mid-South Region	$ 12,044	$ 132,900	+13.3	+11.7
Alabama	2,670	29,589	+12.9	+12.7
Arkansas	1,483	16,566	+ 9.4	+ 9.6
Louisiana	3,233	34,971	+18.9	+14.8
Mississippi	1,498	16,581	+11.5	+10.4
Tennessee	3,160	35,193	+11.1	+ 9.4

Source: Business Week, April 13, 1981.

Table 1 shows personal income in the nation rose 11.4 percent from 1979. Regional growth was only slightly higher. Growth in December of 13.3 percent was identical for the United States and the Mid-South. Louisiana was the only regional state with personal income growth exceeding that of the nation in December. Energy development was the contributing factor.

Table 2 shows the value of construction contracts awarded in the United States and in the Mid-South states for which data are available. Louisiana was the only regional state having a smaller decline than the 12.6 percent in the nation.

Residential building construction fell 15.2 percent in the nation from 1979. Declines in the region ranged from 6.0 percent in Mississippi to 14.3 percent in Arkansas. Non-residential building gained 4.3 percent in the nation but declined 1.0 percent in the Mid-South. Mississippi, with an 83.7 percent increase, failed to offset declines in the other states. Public works and utilities construction awards were down 27.6 percent in the nation and 69.6 percent in the region. Louisiana was the only state having an increase.

There was a decline of 25.8 percent in the United States in dwelling unit starts in 1980 from 1979. Dwelling unit starts declined slightly below the amount in the nation in all the Mid-South states.

In 1980, the United States labor force increased almost 1.0 percent from the year before (see Table 3). Alabama, Arkansas, and Tennessee had about the same growth. Louisiana had a growth rate of 4.3 percent, and Missis-

Table 2

VALUE OF CONSTRUCTION CONTRACTS AWARDED IN 1980
AND PERCENTAGE CHANGE FROM 1979
($ figures in thousands)

Contracts Awarded	United States	Mid-South States*	Alabama	Arkansas	Louisiana	Mississippi	Tennessee	West Tennessee
Total Construction	$147,163,800	$8,844,700	NA	$1,249,600	$3,279,100	$1,549,200	$2,766,800	$806,000
Percent Change	-12.6	-37.1		-27.7	- 7.4	-60.2	-43.4	- 8.0
Total Building	$115,550,900	$6,790,000	NA	$1,007,600	$2,364,800	$1,215,600	$2,202,000	$673,400
Percent Change	- 7.4	- 6.8		-11.9	-12.7	+24.9	-10.4	- 9.3
Residential Building	$ 63,206,000	$3,562,300	NA	$ 642,900	$1,134,500	$ 599,200	$1,185,700	$356,200
Percent Change	-15.2	-11.5		-14.3	-11.0	- 6.0	-12.9	- 5.2
Non-residential Building	$ 52,344,900	$3,227,900	NA	$ 364,700	$1,230,400	$ 616,500	$1,016,300	$317,200
Percent Change	+ 4.3	- 1.0		- 7.2	-14.2	+83.7	- 7.2	-13.5
Public Works & Utilities	$ 31,612,900	$2,054,600	NA	$ 241,900	$ 914,300	$ 333,600	$ 564,800	$132,600
Percent Change	-27.6	-69.6		-58.6	+ 9.8	-88.6	-76.7	- 0.9
Dwelling Unit Starts	1,297,700	81,176	NA	14,719	24,075	14,851	27,531	6,999
Percent Change	-25.8	-22.5		-23.5	-25.7	-17.5	-21.5	-17.6

*Does not include Alabama.
NA--not available.

Source: Dodge Construction Potentials and Survey of Current Business.

Table 3

LABOR, DECEMBER 1980, AND PERCENTAGE CHANGE FROM DECEMBER 1979

	United States	Alabama	Arkansas	Louisiana	Mississippi	Tennessee
Total Civilian Labor Force	104,778,000	1,643,900	942,100	1,746,000	1,011,700	2,011,300
Percent Change	+ 0.9	+ 0.7	+ 0.9	+ 4.3	+ 2.8	+ 0.9
Unemployment Rate 1980	6.9	8.6	7.9	6.4	7.6	7.2
1979	5.6	7.2	6.6	6.2	6.2	6.2
Non-Agricultural Wage & Salary Employment	91,839,000*	1,352,400	755,400	1,581,600	833,200	1,771,400
Percent Change	+ 0.5	- 1.9	- 0.3	+ 3.7	- 2.0	- 2.2
Manufacturing Employment	20,332,000*	354,700	208,200	216,200	218,900	516,400
Percent Change	- 3.1	- 4.8	- 3.3	+ 1.0	- 5.8	- 2.5
Non-Manufacturing Employment	71,507,000*	997,700	547,200	1,365,400	614,300	1,255,000
Percent Change	+ 1.6	- 0.8	+ 0.8	+ 4.1	- 0.6	- 2.0
Production Workers in Manufacturing						
Average Weekly Earnings	$314.52	$275.25	$242.81	$343.93	$230.11	$262.87
Percent Change	+10.3	+ 5.4	+11.7	+14.6	+11.8	+11.7
Average Weekly Hours	40.9	40.3	40.2	42.2	40.3	41.2
Percent Change	nc	- 3.6	+ 0.8	+ 0.7	+ 0.2	+ 1.7
Average Hourly Earnings	$7.69	$6.83	$6.04	$8.15	$5.71	$6.38
Percent Change	+10.3	+ 9.3	+10.8	+13.8	+11.5	+ 9.8

*Seasonally adjusted.

Source: Survey of Current Business and State Employment Security Offices.

sippi had 2.8 percent. The unemployment rate was up one or more percentage points except in Louisiana. In spite of the high growth in the labor force there, the unemployment rate increased only 0.2 percent.

Non-agricultural wage and salary employment grew 3.7 percent in Louisiana compared with a 0.5 percent gain in the nation. The other four states had losses ranging from 0.3 percent in Arkansas to 2.2 percent in Tennessee. Louisiana was the only regional state having an increase in manufacturing employment. The nation had a 3.1 percent decline. Alabama, Arkansas, and Mississippi had greater losses. Tennessee had a 2.5 percent decline.

Average weekly earnings of production workers in manufacturing of $314.52 in the nation was an increase of 10.3 percent from 1979. Louisiana had the highest average earnings as well as the largest increase (14.6 percent). Average weekly earnings in Alabama had a growth rate of only 5.4 percent. Most of the small increase was due to a decline of 3.6 percent in average weekly hours. Average hourly earnings did not increase as much as in the United States in Alabama and Tennessee. Arkansas, Louisiana, and Mississippi had larger increases.

Table 4, showing sales tax collections, is an indicator of retail sales. Mid-South sales tax collections in 1980 rose only 6.5 percent from 1979. This was less than the inflation rate. Alabama and Tennessee had increases that were less than the regional average.

Activity at member banks in the Eighth Federal Reserve District, which includes western Tennessee, northern Mississippi, and all of Arkansas, is shown in Table 5. Banking activity for all domestically chartered commercial banks in the United States shows larger increases than for member banks in District 8. Total loans were below a year earlier in both Arkansas and Tennessee.

Total deposits increased in the district, although not as much as in the nation. Net demand deposits were down in the region from 1979. Only time deposits had increases that were slightly higher than in the United States.

Activity in the regional savings and loan associations is shown in Table 6. Mortgage loans continued to decline from the year before. The decrease in Arkansas was less than 1.0 percent, and in Louisiana, 3.0 percent. Mortgage loans in the other three states decreased about one-fourth. Net savings flow increased in Alabama, Louisiana, Missis-

Table 4

1980 MID-SOUTH STATE SALES TAX COLLECTIONS
AND PERCENTAGE CHANGE FROM 1979

Area	1980 Collections (thousands)	Percent Change from 1979
Mid-South States	$3,181,166	+ 6.5
Alabama	515,075	+ 1.4
Arkansas	346,562	+11.0
Louisiana	697,353	+13.3
Mississippi	628,346	+ 7.2
Tennessee	993,830	+ 3.0

Source: State Departments of Revenue.

Table 5

BANKING - MEMBER BANKS AS OF 12/31/80: PERCENTAGE CHANGE FROM COMPARABLE DATE 1979

	United States*	Mid-South States District 8 Only	Alabama District 6	Arkansas District 8	Louisiana District 6 Only	Mississippi District 8 Only	Tennessee District 8 Only
Total Loans	+ 6.5	- 2.0	NA	- 1.1	NA	+ 4.2	- 4.4
Total Deposits	+15.0	+10.7		+10.0		+10.7	+11.8
Net Demand Deposits	+14.6	- 6.9		- 7.5		- 6.7	- 6.0
Time Deposits	+15.3	+16.0		+16.4		+16.3	+15.0

* United States data are for all domestically chartered commercial banks except for branches of foreign banks.

Source: Federal Reserve Board of St. Louis and the Federal Reserve Bulletin.

Table 6

SAVINGS AND LOAN ACTIVITY, 1980

	Mid-South States	Alabama	Arkansas	Louisiana	Mississippi	Tennessee
Mortgage Loans Made (millions)	$2,816.9	$385.8	$620.2	$1,013.7	$267.5	$529.7
Percent Change from 1979	-13.5	-25.7	- 0.8	- 3.0	-28.3	-23.8
Net Savings Flow (millions)	$1,938.4	$325.7	$288.0	$ 724.2	$237.4	$363.1
Percent Change from 1979	+18.3	+ 7.5	-34.1	+41.6	+44.5	+62.6

Source: Federal Loan Home Banks.

sippi, and Tennessee. There was a 34.1 percent decrease in Arkansas.

In Table 7, ordinary life insurance sales and the percentage change from 1979 are shown for the United States and the Mid-South states. The region, with a 16.9 percent increase, performed better than the nation. Only Tennessee failed to match the national growth.

Cotton and soybean production are shown in Table 8. Wet fields and cool weather deterred land preparation and planting in the spring. A record-breaking heat wave developed in June. Both soybeans and cotton were seriously affected throughout July and August.

Table 7

1980 ORDINARY LIFE INSURANCE SALES AND PERCENTAGE CHANGE FROM 1979

Area	1980 Sales (thousands)	Percent Change from 1979
U.S. Total	$364,388,907	+14.2
Mid-South Region	$ 28,649,804	+16.9
Alabama	6,641,379	+15.3
Arkansas	2,973,068	+17.0
Louisiana	8,380,555	+23.1
Mississippi	3,463,112	+15.8
Tennessee	7,191,690	+12.2

Source: Life Insurance Agency Management Association.

Table 8

MID-SOUTH CROP PRODUCTION

	Cotton Production		Soybean Production	
Area	1980 (thousands of bales)	Percent Change from 1979	1980 (thousands of bushels)	Percent Change from 1979
United States	11,124	-24.0	1,817,097	-19.9
Mid-South States	2,530	-21.6	281,500	-41.5
Alabama	275	-15.1	31,500	-41.4
Arkansas	450	-25.7	69,600	-51.7
Louisiana	455	-34.1	70,350	-25.0
Mississippi	1,150	-20.0	61,600	-48.2
Tennessee	200	+17.0	48,450	-31.5

Source: Crop Production, 1980 Annual Summary, U.S. Department of Agriculture, January 14, 1981.

LABOR 1981	United States (January)	Mid-South States				
		Alabama (January)	Arkansas (January)	Louisiana (February)	Mississippi (January)	Tennessee (January)
Civilian Labor Force	104,671,000	1,633,300	933,000	1,756,200	1,000,800	1,980,100
Percent Change Year Ago	+ 1.4	+ 1.8	+ 0.8	+ 4.2	+ 1.8	+ 0.5
Unemployed	8,544,000	151,300	80,800	123,900	86,500	172,700
Percent Change Year Ago	+21.3	+19.7	+15.9	+ 8.9	+30.5	+22.4
Unemployment Rate						
1981	8.2	9.3	8.7	7.1	8.6	8.7
1980	6.8	7.9	7.5	6.8	6.7	7.2
Non-Agricultural Wage & Salary Employees	90,089,000	1,355,500	739,700	1,607,900	826,400	1,702,100
Percent Change Year Ago	+ 0.5	- 0.1	+ 0.2	+ 4.4	- 0.5	- 2.2
Manufacturing Employment	20,164,000	356,500	208,900	214,800	218,700	497,800
Percent Change Year Ago	- 3.0	- 4.1	- 2.6	+ 3.0	- 4.3	- 3.2
Non-Manufacturing Employment	69,925,000	999,000	530,800	1,393,100	607,700	1,204,300
Percent Change Year Ago	+ 1.6	+ 1.3	+ 1.4	+ 4.6	+ 0.9	- 1.8
Average Weekly Earnings of Production Workers in Manufacturing	$308.43	$278.29	$239.55	$337.84	$226.97	$260.80
Percent Change Year Ago	+11.3	+ 7.9	+ 9.5	+12.7	+ 9.6	+12.4
Average Weekly Hours of Production Workers in Manufacturing	39.9	40.1	39.4	41.0	39.2	40.0
Percent Change Year Ago	+ 0.3	- 1.7	- 0.8	+ 0.2	- 1.0	+ 1.0
Average Hourly Earnings of Production Workers in Manufacturing	$7.73	$6.94	$6.08	$8.24	$5.79	$6.52
Percent Change Year Ago	+11.1	+ 9.8	+10.3	+12.4	+10.7	+11.3

*Seasonally Adjusted.

Source: Departments of Employment Security.

CONSTRUCTION February 1981	United States	Mid-South States	Alabama	Arkansas	Louisiana	Mississippi	Tennessee	West Tennessee
Value of Construction Contracts Awarded								
Total Construction								
Percent Change Year Ago	+ 2.2	+18.6	NA	+ 58.7	- 9.5	+ 68.9	+31.8	+31.5
Percent Change Year-to-Date	+ 1.7	+15.9		+ 41.7	- 6.6	+ 37.9	+ 7.4	-20.9
Total Building								
Percent Change Year Ago	+ 5.6	+ 1.0	NA	+ 20.5	-20.6	+ 17.0	+34.3	+30.1
Percent Change Year-to-Date	+ 7.6	+ 7.8		+ 24.3	-14.6	+ 11.0	+36.7	-11.7
Residential Building								
Percent Change Year Ago	- 3.6	+15.1	NA	+ 19.0	+15.1	+ 29.7	+ 5.7	+11.3
Percent Change Year-to-Date	- 1.5	+ 9.7		+ 16.4	+20.0	+ 19.2	- 9.0	+ 2.8
Non-Residential Building								
Percent Change Year Ago	+17.2	-12.1	NA	+ 23.0	-37.5	- 13.7	+91.0	+62.9
Percent Change Year-to-Date	+18.7	+ 6.0		+ 38.4	-32.0	- 7.4	+99.0	-24.2
Public Works and Utilities								
Percent Change Year Ago	- 9.4	+81.6	NA	+231.4	+52.7	+195.0	+26.8	-36.1
Percent Change Year-to-Date	-16.1	+47.3		+141.1	+27.5	+113.3	+13.9	-49.3
Total Dwelling Unit Starts to Date	159,700	11,111	NA	2,079	3,922	2,105	3,005	925
Percent Change Year Ago	+ 3.7	-1.0		+4.4	+15.7	+24.0	-37.6	-9.4

Source: F.W. Dodge Reports and Survey of Current Business.

Finance

Financial data for District 8 member banks of the Federal Reserve System, covering West Tennessee, North Mississippi, and Arkansas, are compared with all domestically chartered banks in the United States. Banking activity was less in the region than in the nation. Loans in the United States increased 5.8 percent; they increased 2.0 percent in North Mississippi but decreased 1.9 percent in Arkansas and 3.1 percent in West Tennessee. Total deposits increased in the Mid-South but did not match the 10.2 percent increase in the nation. The decrease from a year ago of demand deposits was greater in West Tennessee, North Mississippi, and Arkansas than the 3.0 percent decline in the United States. Time deposits increased 17.4 percent in North Mississippi and the nation. Increases in Arkansas and West Tennessee were only slightly less.

Figures from the Federal Home Loan Banks showed mortgage loans made to date were above a year ago in all

the regional states except Arkansas, which had a 17.6 percent decline. Net savings flow was positive, although the amount was not as great as last year in Arkansas, Louisiana, and Mississippi.

FINANCE 1981	United States[1]	Mid-South States District 8 Only[2]	Alabama District 6	Arkansas District 8	Louisiana District 6 Only	Mississippi District 8 Only	Tennessee District 8 Only
Member Banks as of 1/28/81 Percent Change from Comparable Date 1980							
Total Loans	+ 5.8	- 2.0	NA	- 1.9	NA	+ 2.0	- 3.1
Total Deposits	+10.2	+ 6.2		+ 5.1		+ 8.5	+ 7.3
Net Demand Deposits	- 3.0	-18.9		-18.8		-14.7	-21.0
Time Deposits	+17.4	+15.9		+15.2		+17.4	+16.3

[1]United States data are for all domestically chartered commercial banks except for branches of foreign banks.

[2]Mid-South data are available only for District 8, which includes all of Arkansas, North Mississippi, and West Tennessee.

Source: Federal Reserve Board of Governors and the Federal Reserve Board of St. Louis.

SAVINGS AND LOAN ACTIVITY 1981	Alabama (January)	Arkansas (January)	Louisiana (January)	Mississippi (January)	Tennessee (February)
Mortgage Loans Made (millions)	$ 32.0	$ 28.6	$71.6	$27.5	$24.4
Percent Change Year Ago	+ 46.1	- 17.6	+32.3	+56.2	-22.3
Percent Change Year-to-Date	+ 46.1	- 17.6	+32.3	+56.2	+ 1.5
Net Savings Flow (millions)	$ 31.7	($ 2.2)	$21.5	$ 6.5	$ 8.0
Percent Change Year Ago	+2,338.5	-153.7	- 9.7	-18.8	+44.4
Percent Change Year-to-Date	+2,338.5	-153.7	- 9.7	-18.8	+43.5

Source: Federal Home Loan Banks of Little Rock, Cincinnati, and Atlanta.

THE TENNESSEE ECONOMY

Personal income growth in Tennessee was sluggish and did not match that of the nation in the first quarter. Retail sales gained in the quarter from a year ago.

The civilian labor force was 1,980,000 in January, up 0.5 percent from the year before. The unemployment rate jumped to 8.7 percent from 7.3 percent in December and 7.2 percent a year earlier. The high unemployment rate was due not only to layoffs of temporary Christmas workers but to the completion of several construction projects across the state. High interest rates kept others from being started. In the manufacturing sector, lumber and furniture producing were hardest hit.

Non-agricultural wage and salary employment of 1,702,100 workers was a loss of 2.2 percent from a year ago. The decline in the state was the largest in the region. Tennessee was the only Mid-South state losing non-manufacturing employees. A 3.2 percent decline in manufacturing employment was about the same as the national loss.

Average weekly earnings of production workers in manufacturing of $260.80 was up 12.4 percent, compared with 11.3 percent for the nation. The larger increase was due to a 1.0 percent increase in the hours worked in the state and only a 0.3 percent increase in the United States.

Total construction contract awards in the state gained 31.5 percent during the first two months from the depressed levels in 1980. West Tennessee had a 7.4 percent increase in February, but the two-month total was 20.9 percent below last year's. Residential awards were down 9.0 percent during January-February in the state but were 2.8 percent higher in West Tennessee. The nation had a decrease of 1.5 percent. Dwelling unit starts fell 37.6 percent from last year's level in the state. Non-residential building contract awards increased 99.0 percent in the state, but in West Tennessee they were down 24.2 percent. Public works and utilities construction also increased 13.9 percent in the state but fell to about half of the two-month awards in West Tennessee.

Mortgage loans made by the Federal Home Loan Banks decreased 22.3 percent in February from a year ago but were 1.5 percent higher in January-February. Net savings flow was 43.5 percent higher than that for the first two months of last year.

Data on banking activity are available only for District 8 member banks, covering West Tennessee, for the period ending January 28, 1981. Total deposits grew by 7.3 percent and time deposits by 16.3 percent compared with the month ending January 30, 1980. Total loans decreased by 3.1 percent and net demand deposits by 20.0 percent.

Table 1

EFFECTIVENESS OF SOFTWARE PROTECTION

Method	Weighted Response (Scale of 0 to 5)	Percent Using	Effective Use
Patent	0.54	4	2.2
Copyright	1.48	20	29.6
Trade secret	2.31	21	48.5
Object program	3.54	30	106.2
Know-how	2.46	13	32.0
Cryptography	1.24	40	49.6
Other	3.28	17	55.8

Source: Dale W. Clauson, William E. Spaulding, and Thomas R. Wotruba, "Content Analysis: An Approach to the Computer Software Protection Controversy," *American Business Law Journal* 17, no. 2 (Summer 1979): 186.

channels have had varying success. The three most prevalent methods which have been used are patent, copyright, and trade secrecy.

Patent

Patent protection has been described as an effective way to ensure unlawful reproduction and wrongful misappropriation of novel ideas underlying the software. An approval of application for patent grants a monopoly over the use, manufacture, and sale of the item for seventeen years. Obtaining a patent is not an easy matter, though. The application requires full disclosure of the nature of the invention, strict adherence to statutory standards, and a complete sense of prior developments in the art. To be accepted, the invention must meet certain criteria: (1) utility—a beneficial function; (2) novelty—not found in a prior device; (3) unobviousness—in relation to the scope and content of prior art. It must be both original and functional. As such, two classifications of inventions are acceptable: (1) apparatus/machines and/or devices used in connection with a mechanism; and (2) a functional process—a mode of treatment of materials to produce a result. Not covered under patent law are ideas, scientific principles, mathematical algorithms, phenomena of nature, and mental processes:

> A process is unpatentable if a patent thereon would be, in practical effect, a patent on a mathematical formula or algorithm.... A process that "merely uses" a mathematical algorithm toward an end in a "technological field" may constitute an application of the algorithm and thus be patentable subject matter.[14]

Among the advantages of patent protection of computer programs are the following: it balances the competing interests of software developers (by providing a limited monopoly) and the general public (by requiring full disclosure); it encourages invention by rewarding inventors; it attracts risk capital to industrial research; and it prevents hoarding of technological innovation. Protection is given not only to a copy of the program but also against someone developing an identical program independently. Some feel that patent protection allows greater exchange of information which augments other technological advances dependent upon machine processing. Royalties and recognition are provided to the firm and to individual inventors-programmers. "By rewarding producers of new and useful programs with limited monopolies in exchange for public disclosure of their inventions, society at large will benefit."[15]

There are disadvantages associated with patents, however. The procedure for patent application involves expensive filing and legal fees and the time required to draft meticulous claims. Applications may take two to three years for the Patent and Trademark Office to process. There is an incompatibility with secrecy, since the patent application is open to public inspection and copying. This, in turn, makes it difficult to detect and prove infringements of rights. Perhaps the two greatest blockages to obtaining patent protection are the delay in processing of the application and the high risk involved in supporting a claim. An examination of the history of patent litigation outlines these controversial aspects of this form of protection for software.

There have been four principal characters in the patent story for computer software: the Patent and Trademark Office (PTO), the Court of Customs and Patent Appeals (CCPA), the Supreme Court, and the Congress. The PTO has consistently turned down applications for patents on computer programs, perhaps because they have been "fearful of having to process and examine numerous applications on computer programs . . . for which they would be unable to readily perform an adequate search."[16] Frequently, the CCPA has, in reviewing the rejected applications, reversed the PTO's decisions and ruled in favor of granting a patent. Cases that have been taken to the Supreme Court have had diverse outcomes, the majority of which have supported the PTO in not granting a patent:

> The only theme running through [the Supreme Court's] decisions is a continuing plea for special legislation from Congress. While this judicial abstention may have the ultimate effect of encouraging legislation in the area of software patentability, its immediate impact will be to discourage software owners from seeking out protection. Owners of programs are singly unwilling to entrust their valuable property to a

[14]Harold L. Johnson, Jr., "Computer Program Patentability—The CCPA Refuses to Follow the Lead of the Supreme Court in *Parker* v. *Flook*," *North Carolina Law Review* 58, no. 7 (January 1980): 339, 340.

[15]Ibid., p. 319.

[16]Charles Gorenstein, "The Dual Standard of Patentability: A New Look at the Computer Issue," *Journal of the Patent Office Society* 62, no. 2 (February 1980): 104.

system of protection in which so many questions remain unanswered.[17]

What follows is a partial list of the many cases that have arisen since 1968, when the PTO first declared programs unpatentable as being creations in the area of thought.

Recent Patent Cases

In *In re Prater*, 415 F.2d 1393 (C.C.P.A. 1969), the PTO had contended that the novelty of Prater's process lied in the idea or mental process, even though a machine carried out the mental steps for him. The CCPA disagreed with this "mental process" doctrine and saw no grounds to deny patentability. Likewise in *In re Musgrave*, 431 F.2d 882 (C.C.P.A. 1970), the CCPA rejected the "mental steps" doctrine, indicating that the doctrine might have validity only when some step in the process was "purely mental and incapable of being performed by a machine."[18]

A patent was sought for a method of programming a computer to automatically convert the binary coded decimal notation for a number into the pure binary notation for the same number, in *Gottschalk v. Benson*, 409 U.S. 63 (1972). The Supreme Court held that the process was an algorithm and that algorithms, like mathematical formulas, are phenomena of nature and scientific principles, and therefore unpatentable subject matter. The granting of a patent would have given Benson a monopoly on a general method of solving a material problem and all uses to which such a method of solution could be put.

Another application for a patent (on a machine system for automatic processing of bank transactions) was rejected by the PTO to avoid giving a monopoly on a method of banking. The CCPA reversed, and in *Dann v. Johnston*, 425 U.S. 219 (1976), the Supreme Court held the claim unpatentable. To those skilled in the art of record-keeping machine systems, the apparatus was seen to be obvious; that is, it was not sufficiently different from prior systems of automated record keeping.

Parker v. Flook, 437 U.S. 584 (1978), brought yet another rejection by the Supreme Court. A method for update parameters, called "alarm limits," which were used to detect the presence of abnormal conditions in catalytic conversion, was deemed unpatentable. The Court saw an algorithm as the only novel feature, and although its presence alone was not fatal, the invention was unpatentable "because once that algorithm is assumed to be within prior art, the application, considered as a whole, contains no patentable invention." (*Flook* at 594) Patentability would exist only if (1) the algorithm was applied to a new and useful end and (2) that application contained some inventive concept other than the algorithm.[19] Disagreement over the Court's decision in *Flook* lies in its view of an algorithm by "equating an algorithm with a 'mathematical expression' of a scientific truth. The two are not the same."[20] Expressions are mathematical, logical *symbols* or some combination of the two, while algorithms are *procedures* for reaching a solution. Hence, "algorithms do not occur in nature."[21]

Another author has compared patents for slide rules to those requested for computer programs. Slide rules are designed to perform particular algorithms when mathematically manipulated, similar to computers programmed to perform algorithms through electrical commands. According to Gorenstein:

> The PTO continues to allow patents on slide rules based on the type of material algorithm performed thereby, while relying on *Benson* and *Flook* to deny protection to computer programs and methods of calculation solely suitable for execution by electronic data processing equipment. These positions are inconsistent and irreconcilable.[22]

Because of the decision in *Flook*, the PTO had hoped there would be a moratorium on program-related patents. However, the CCPA continues to attempt patent protection, especially for systems involving more than new computer programs. More recent challenges include Honeywell Information Systems, Inc. (for a method of retrieving information for the basic system of a computer from a storage unit within the computer that is otherwise hard to reach) and Federal-Mogul Corp. (use of a computer to calculate the proper time and temperature for processing synthetic rubber in a mold).[23] The issue of patent protection for a computer program not only centers on how that program is defined or what it is, but also concerns the process in which it is used and any attempts to gain monopoly use over an algorithm:

> If a court determines that a program is identical to the algorithm it expresses, then the court will find the program unpatentable. But if the program is merely a useful process which utilizes the algorithm without pre-empting it, and the program clears the hurdles of novelty and unobviousness as well, the court will find patentability.[24]

As Congress continues to ignore pleas for legislation in this area, the dispute continues, and some software developers seek other protection.

Copyright

Copyright protection is a second method used by software developers. A copyright reserves to an author

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[17]Michael Alan Pope and Patrick Bruce, "Protection of Proprietary Interests in Computer Software," *Alabama Law Review* 30, no. 3 (Spring 1979): 542.

[18]Gemignani, p. 296.

[19]Johnson, p. 324.

[20]Gorenstein, p. 105.

[21]Ibid., p. 106.

[22]Ibid., p. 103.

[23]Stephen Wermiel, "Dispute on Whether Computer Programs Are Subject to Patents Back in Top Court," *Wall Street Journal*, March 18, 1980, p. 13.

[24]Gemignani, p. 294.

the exclusive right to print, reprint, publish, copy, and vend an original work. Such a right exists during the lifetime of the author and fifty years beyond. Obtaining a copyright is done by attaching a copyright notice to the published work and depositing copies of the work, accompanied by filing fee, with the Register of Copyrights. To be eligible for registration, the work must meet certain criteria and requirements.

On May 19, 1964, the Copyright Office began accepting computer programs for deposit and registration, and in 1974 it distributed a circular which defined "computer programs," posed two basic questions considering their registrability, and listed registration requirements for computer programs (see Appendix A). In 1976, a new copyright act was passed. The revised law specifically addressed rights regarding computers. Section 117 of the law (Title 17, U.S. Code) reads:

> Scope of exclusive rights. Use in conjunction with computers and similar information systems. Notwithstanding the provisions of sections 106 through 116 and 118, this title does not afford to the owner of copyright in a work any great or lessor rights with respect to the use of the work and in conjunction with automatic systems capable of storing, processing, retrieving, or transferring information, or in conjunction with any similar device, machine, or process, than those afforded to works under the law, which title 17 or the common law or statutes of a State, in effect on December 31, 1977, as held applicable and construed by a court in an action brought under this title.[25]

Some of the requirements for copyright registration are particularly vital to the question of whether such protection should be given computer programs:

1. According to section 102(a) of Title 17, the registrant must show an original work of authorship fixed in a tangible medium from which it can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. Whether a program is sufficiently tangible or is the original writing of an author has been doubted. Dorn, in arguing against the copyrightability of programs as compared to books, outlines seven categories where the analogy fails: definition, degree of completion, authority, creativity, impact of errors, stand-alone nature, and programmers not being authors.[26]

2. Section 102(b) states that protection should not be extended to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work. As seen in the discussion of patent protection, programs are often equated with ideas and principles and as such may not be copyrightable.

Obviously, even the software industry has questioned the validity and value of copyright protection for its works. Between 1964 and 1977 only 1,205 of the millions of programs created were registered with the Copyright Office. Of these, 971 were from IBM and Burroughs alone. There are reasons for dissatisfaction with copyright programs. Copyright prevents only unauthorized copying, not the copy's use, and without protection for the underlying algorithms, the protection is felt inadequate for the developer. Punched cards or magnetic tapes might not be included, unless a "visually perceptible reproduction or description" or the program is also deposited. "Some arguers against copyright contend it could lead to the general perception of software as tangible, and thus subject to sales and property taxes."[27] Finally, it "fails to provide meaningful protection against misappropriation of computer programs,"[28] and the risk and expense of litigation is high.

In the attempt to prove infringement of rights, the problems encountered are many. There are four basic steps toward remedy: (1) find that the infringement took place; (2) prove the defendant copied; (3) prove improper appropriation (substantial similarity); and (4) prove access, i.e., defendant had reasonable opportunity to copy. Obstacles bar the way to such remedy. What constitutes "copying" is not clear. One suggestion is that it is "the loading or putting of a program into a computer."[29] But what if a program is translated into a different language, e.g., FORTRAN to COBOL? Are copyright rules regarding translations applicable? And program instructions and data can be reordered yet still produce equal results when run through the computer, making proof of copying dubious. Therefore, it is difficult to prove striking similarities between the original program and the alleged stolen item. Often expert witnesses need to be called in to assess and compare. Improper appropriation is harder to prove when the algorithm underlying the work is deemed uncopyrightable. Proving access may be impossible. Some programs have been "snatched" over telephone lines. To sum up, the situation is unclear. The triers of fact may know too little about the computer world to effectively decide. Argument by analogy to other areas protected by copyright is often used. Finally, the law is unsettled, with a paucity of cases for precedence.

A recent case was *Data Cash Systems, Inc. v. J S & A Group, Inc.*, 480 F. Supp. 1063 (1979). In this case, the judge held that an object program in Read Only Memory and not in a form readable by "the human eye" is not copyright protected. Neither copyright act, the court ruled, covers programs at "the stage at which the instructions are incorporated into the mechanical device they control . . . and so can no longer be read, even by

[25]Donald F. Johnston, *Copyright Handbook* (New York: R. R. Bowker Co., 1978), p. 153.

[26]Philip H. Dorn, "Programs Are Not Books," *Datamation* 23 (November 1977): 232-33.

[27]Myers, p. 132.

[28]Pope and Bruce, p. 545.

[29]Kuhn and Ball, p. 29.

trained programmers."[30] Decisions of this sort indicate that the new copyright law did not go far enough in outlining protection for computer programs, and clarification for such instances is definitely needed.

Trade Secrecy

Another principal method used by the software industry for protection is trade secrecy. A trade secret "may consist of any formula, pattern, device, or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who don't know or use it."[31] Protection for a computer program is generally upheld if it is in continuous use in the operation of business, contains some degree of novelty, and is a real economic investment for the owner. Methods for use of this practice include contractural licensing agreements and nondisclosure clauses in contracts of employment. Under contract law, the developer seeks to bind the party to an agreement not to make unauthorized copies of or reveal to others any program which is being used under license from a software developer or which the party helped to write. There may be additional protection through criminal law prosecution under state or federal larceny statutes if valuable property in the form of a program is stolen [*Hancock v. Texas*, 402 S.W. 2d 906 (Tex. Crim. App. 1966)]. To obtain judicial protection, it must be shown that the defendant obtained the program through "improper means" or violated a contractural or fiduciary obligation.

Protection for programs through trade secrecy does have some serious shortcomings. The first requirement is secrecy, for if that is lost, there is no protection. Devising physical security may lead to great expense for the software firm. Such physical security devices may not even prevent loss. Programmers are mobile, and as the programmer moves on to another job, so can the program. Exclusive rights to a program can still be lost through accidental or inept disclosure and through discovery by competitors. In such a case, the burden of proof is on the developer/firm, and it can be very difficult to prove misappropriation. The law regarding trade secrecy is not uniform through the United States; state laws vary, and this may complicate the effectiveness of trade secrecy. Finally, some argue that the use of trade secrecy is hostile to the free exchange of ideas, leads to duplication of programmer effort, and thus is wasteful for the general public.

Wessel has suggested six tests of whether a program qualifies as trade secret for a software firm to consider before using this route: (1) Is the program really secret? (2) Is the program really valuable? (3) Was the program developed and owned by the company? (4) Was it difficult to develop the program? (5) Has the program been copied? (6) Is it fair to protect the program?[32]

Trade secrecy, like patent and copyright, has its benefits and disadvantages. Characteristics of these three protective mechanisms are compared in Table 2, which lists both general and software considerations. None is positive in all areas. This has led to dissatisfaction on the part of many programmers, a lack of confidence in any of the methods, and a cry for clarification of the question of computer program protection.

Table 2

CHARACTERISTICS OF PROTECTIVE MECHANISMS

	Copyright	Patent	Trade Secrecy
General Considerations			
1. National uniformity	yes	yes	no
2. Protection effective upon	creation of work	successful prosecution of application	entrance into contractual relationship
3. Cost of obtaining	nil	moderate	moderate
4. Term of protection	life plus 50 years or 75 years	17 years	possibility of both perpetual protection and termination at any time
5. Cost of maintaining	nil	nil	significant
6. Cost of enforcing	moderate	moderate	higher
7. Availability of statutory damages	yes	no	no
Attorney's fees from infringers	yes	yes	no
8. Protection lost by	gross neglect	unsuccessful litigation	disclosure
Software Considerations			
9. Consistency with other copyright areas	yes	no	no
10. Availability of (for some programs)	yes	unclear	yes
11. Universal availability (for all programs)	yes	no	no
12. "Process" protectable	no	yes	yes
13. Suited to mass distribution	yes	yes	no

Source: Michael Alan Pope and Patrick Bruce, "Protection of Proprietary Interests in Computer Software," *Alabama Law Review* 30, no. 3 (Spring 1979): 559.

Recommendations

After passage of the revised copyright law in 1976, the National Commission on New Technological Uses of Copyrighted Works (CONTU) was charged with studying the applications of copyright law to computer programs. CONTU recommended copyright protection "to encourage the creation and broad distribution of computer programs in a competitive market [and prevent] the

[30]"The Law Turns a Blind Eye to Computer Copyright," *The Economist* 274 (March 8, 1980): 93.

[31]4 Restatement of Torts 757, comment b, at 5 (1939).

[32]Milton R. Wessel, "Legal Protection of Computer Programs," in Bigelow, pp. 1-12.

unjustifiable utilization of another's creative efforts without the permission of the original creator."[33] The CONTU report suggested that program copyright should (1) proscribe unauthorized copying of the works; (2) not inhibit the rightful use of them; (3) not block the development and dissemination of programs; and (4) not grant anyone more economic power than necessary to achieve an incentive to create. ADAPSO favors revisions to the copyright statutes that "will specifically include programs against the unauthorized copying and use of computer programs" but maintains that "strengthening of one form of protection shouldn't be to the detriment of another."[34]

Such action is definitely needed. The statutes should be revised to provide for adequate protection of financial investments in software developments; technological progress from full dissemination of software information; and public benefit from new applications of computer technologies.[35] However, this cannot occur until the issues of program definition and the social and economical interests of all the parties affected by legal protection are addressed, studied, and acted upon. Until that happens, protective methods for computer software will be a mishmash, trade secrecy will be overused, copyrights will be issued reluctantly, and the Court of Customs and Patent Appeals will continue battling the Patent and Trademark Office.

Appendix A

Circular 61, February 1974

COPYRIGHT OFFICE
Library of Congress
Washington, D.C. 20559

COMPUTER PROGRAMS

WHAT IS A COMPUTER PROGRAM?

In general, a computer program is either a set of operating instructions for a computer or a compilation of reference information to be drawn upon by the computer in solving problems. In most cases the preparation of computer programs involves substantial elements of gathering, choosing, rejecting, editing, and arranging material. Some programs also embody verbal material which is written by the programmer and can be considered literary expression.

ARE COMPUTER PROGRAMS REGISTRABLE FOR COPYRIGHT?

The registration of computer programs involves two basic questions: (1) Is a program the "writing of an author" and thus copyrightable and (2) Can a reproduction of the program in a form actually used to operate or be "read" by a machine be considered an acceptable "copy" for copyright registration?

Both of these are doubtful questions. However, in accordance with its policy of resolving doubtful issues in favor of registration whenever possible, the Copyright Office will consider registration for a computer program if certain requirements have been met.

REGISTRATION REQUIREMENTS FOR COMPUTER PROGRAMS

Registration for a computer program will be considered if:

— The elements of assembling, selecting, arranging, editing, and literary expression that went into the compilation of the program are sufficient to constitute original authorship.

— The program has been published with the required copyright notice; that is, "copies" (i.e., reproductions of the program in a form perceptible or capable of being made perceptible to the human eye) bearing the notice have been distributed or made available to the public.

— The copies deposited for registration consist of two complete copies of the program in the form as first published. If the first publication was in a form (such as machine-readable tape) that cannot be perceived visually or read by humans, a visually perceptible reproduction or description (such as a print-out of the program) must also be deposited.

— An application for registration is submitted on Form A. Detailed instructions for registration are given on the application form.

— The applicant also submits a brief explanation of the way in which the program was first made available to the public, and the form in which the copies were published. This explanation is not essential in every case, but it will generally facilitate examination of the claim.

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[33] *National Commission on New Technological Uses of Copyrighted Work, Software Subcommittee Report and Additional Views* 6, cited by Kuhn and Ball, p. 29.

[34] Myers, p. 128.

[35] Pope and Bruce, p. 532.

FINANCIAL AND OPERATIONAL USES OF CREDIT-RATING ANALYSES

*Harold W. Fox**

Virtually all firms use credit information to help set payment terms for customers. Only a few analyze these readily available data for other financial and operational purposes. An alert manager can share this valuable by-product with others at negligible incremental cost.

An Analytical Framework

To simplify the exposition, in this article the chart format will be uniform. Filled in with statistics from a credit department, this simple chart can be a helpful tool for auditing, credit administration, financial management, marketing, and procurement. Other uses will occur to the reader.

The multipurpose chart (Table 1) classifies accounts

Table 1
MULTIPURPOSE CHART

Estimated Financial Strength	Dun & Bradstreet	Composite Credit Appraisal: High 1	Good 2	Fair 3	Limited 4
$50 million and up	5A				
$10 million to $49,999,999	4A				
$1 million to $9,999,999	3A				
$750,000 to $999,999	2A				
$500,000 to $749,999	1A				
$300,000 to $499,999	BA		x		
$200,000 to $299,999	BB				
$125,000 to $199,999	CB	30,000	20,000	10,000	cash
$75,000 to $124,999	CC				
$50,000 to $74,999	DC				
$35,000 to $49,999	DD				
$20,000 to $34,999	EE				
$10,000 to $19,999	FF				
$5,000 to $9,999	GG				
Up to $4,999	HH				
	Not rated				
	Not listed				

along two dimensions: estimated financial size and composite credit appraisal. For example, the top row refers to accounts having a net worth of at least $50 million. Lesser financial strengths appear in descending order. The fifteenth row lists accounts with estimated net worth of under $5,000.

The first column denotes the most favorable composite credit appraisal. At the right are lower overall evaluations.

**George A. Ball Distinguished Professor, Ball State University, Muncie, Indiana.*

Users of a credit-rating service such as Dun & Bradstreet further show the corresponding rating codes. Suppose a customer's net worth is $375,000; composite credit appraisal is "good." This information is summarized by the Dun & Bradstreet symbol BA2. Data about this customer and others in the $300,000 to $499,999 range with "good" composite appraisal are tallied in the cell marked x.

The most frequent use of this chart is to record tentative credit limits. In the absence of unfavorable information or special circumstances, each account has a ceiling appropriate to its slot on this two-dimensional grid. To illustrate, in Table 1 each account with net worth between $125,000 and $199,999 has suggested credit ceilings of $30,000, $20,000, and $10,000, respectively, for composite appraisals of "high," "good," and "fair." In this case, accounts appraised "limited" are on a cash basis. Credit clearance is routinized for delegation to clerks. Part of the routine is a search for auxiliary data, which a senior analyst evaluates.

Such an efficient "management by exception" procedure is common. Apparently, however, very few credit departments also use a chart like this to depict the credit-ratings distribution of:

Number of present customers
Dollar balances or average amounts
Average collection periods and interquartile ranges
Delinquencies and defaults as a percentage of sales to buyers with that rating

Most credit departments have this information ready for printout or posting. What are some purposes of these supplementary statistics? A few examples are in order.

Present Customers and Dollar Balances

Using the multipurpose chart to summarize the number of present customers by credit rating reveals the portfolio's quality. Entries on the bottom and at the right of the chart indicate the extent to which the company is vulnerable from customers that are small, unrated, not listed, or limited. The same diagnosis in terms of dollar balances shows additionally the apparent quality of the receivables for which the credit manager is responsible.

Payment Speeds

The next step is to tabulate, separately for each cell's set of accounts with the same terms, payment speeds during the past year. Conceptually, there are arrays for: 5A1, 4A1

. . . GG4, HH4, NR ("not rated"), NL ("not listed"). In practice, the credit executive instructs the data center to program the computer for summaries giving the median number of days plus and minus one quartile. (There are several variants. The simplest procedure is to use raw data, as described here. Some firms weight the number of days by amounts outstanding or by annual sales. Some use a wider range.) The printout, like Table 2, shows three numbers in each cell. All represent collection periods. The top number is the 75th percentile; the middle is the 50th; the bottom one is the 25th.

Table 2
PAYMENT SPEED
(in days)

Estimated Financial Strength	Dun & Bradstreet	Composite Credit Appraisal: High 1	Good 2	Fair 3	Limited 4
$50 million and up	5A				
$10 million to $49,999,999	4A		25		
			60		
			140		
$1 million to $9,999,999	3A				
$750,000 to $999,999	2A				
$500,000 to $749,999	1A				
$300,000 to $499,999	BA				
$200,000 to $299,999	BB				
$125,000 to $199,999	CB				
$75,000 to $124,999	CC				
$50,000 to $74,999	DC		41		
			45		
			51		
$35,000 to $49,999	DD				
$20,000 to $34,999	EE				
$10,000 to $19,999	FF				
$5,000 to $9,999	GG				
Up to $4,999	HH				
	NR				
	NL				

When these numbers are close together — say, 41, 45, 51 days — the middle half of accounts pay at about the same pace. In Table 2, the middle half of all receivables with a rating of DC2 have this pattern. The credit manager can treat this middle half as a group.

In contrast, payment speeds among the financially stronger 4A2 accounts diverge. One-fourth of these accounts settle within 25 days; three-fourths take longer. In fact, the slowest-paying one-fourth settle in 140 days or more. On these 4A2 accounts, since days outstanding for the two polar percentages are far apart, the credit rating is not a valid guide to payment speed and credit policy. Diversity in accounts' settlement speed within a cell signals a need for additional information sources, separate terms, and closer follow-up.

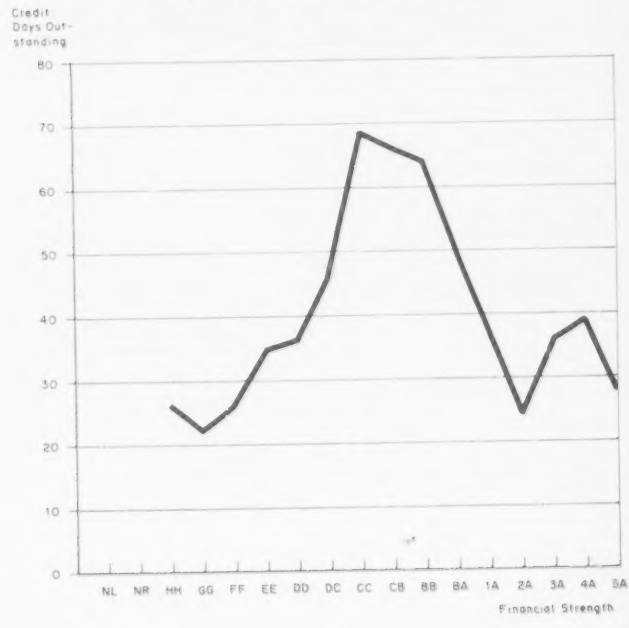
Delinquencies

Some companies, graphing credit classifications against median payment delays, were surprised that the shape of the diagram tended toward a hooked inverted u. For example, in Figure 1, the x axis represents financial strength; the y axis, days outstanding. Both are from lowest to highest. The credit executives expected this graph of median payment delays to consist of a diagonal line with negative slope. As Figure 1 depicts, however, the typical pattern is that customers with the lowest and highest ratings pay more promptly than the ones in between. What causes this paradox? The graph excludes many of the lower-rated customers because of special terms—for example, c.o.d. Low-rated accounts that enjoyed regular terms and therefore were included in this graph were those that wanted to prove their creditworthiness.

After adjustment for omitted accounts, this analysis served as an input to policy formulation. An approximate interest cost per sales dollar was assigned for each credit-rating category. Subsequently several credit managers changed extension criteria and collection procedures. They liberalized somewhat the terms for small firms and tightened follow-up of middle-sized companies.

Table 2 and Figure 1 reveal nothing about the extremely slow payers. These require individual attention. A few credit managers chart delinquencies as a percentage of annual credit sales, separately for each credit-rating cell. One approach is to confine this compilation to amounts on the books at least double the maximum terms. Thus, if 2/10, n/30 are standard, amounts are recorded if unpaid 60 days after invoice date. This compilation shows the apparent quality of the credit balances. It also shows the vendor's exposure.

Figure 1
MEDIAN PAYMENT DELAYS BY CUSTOMERS WITH DIFFERENT CREDIT CLASSIFICATIONS



On the basis of historical experience, the aforemen-

tioned compilation of delinquencies is a leading indicator of eventual defaults (except on the two top ratings, 5A and 4A). Although bankruptcies do occur among top-rated firms (for example, W.T. Grant Co.), in most cases the slow payment records of these firms merely reflect their practice of working with other people's money. This practice compels small vendors to choose between relinquishing these major accounts and incurring financial distress. When interest rates are in double digits, payment delays cause the small vendors overall losses. Worse yet, after small vendors reach their borrowing limit, these payment delays threaten them with insolvency.

Defaults

A historical summary of defaults offers additional guidance for financial policymakers. As shown in Table 3, each cell lists total default dollars as a percentage of the applicable prior year's total credit sales. In the example (Table 3), all sales to 5A-rated companies have been collected. Customers in the 5A1 and 5A2 categories settled their accounts; there were no sales to companies rated 5A3 or 5A4. But of last year's credit sales to customers with rating 1A3, 0.4 percent was uncollectible.

On this default chart (Table 3), the highest percentages cluster in the last column (composite credit appraisal "limited"), just about in the middle of the column. As long as a cell's incremental percentages are acceptably low, additional prospects fitting that cell are eligible for credit.

Table 3

DEFAULTS AS A PERCENTAGE OF LAST YEAR'S CREDIT SALES

Estimated Financial Strength	Dun & Bradstreet	Composite Credit Appraisal: High 1	Good 2	Fair 3	Limited 4
$50 million and up	5A	0	0	—	—
$10 million to $49,999,999	4A	0	0	1.1	—
$1 million to $9,999,999	3A	0	0.2	0.4	0.5
$750,000 to $999,999	2A	0	0.2	0.3	0.5
$500,000 to $749,999	1A	0	0.2	0.4	3.1
$300,000 to $499,999	BA	—	0.3	0.5	6.4
$200,000 to $299,999	BB	—	0.4	0.4	9.1
$125,000 to $199,999	CB	—	0.1	1.2	7.5
$75,000 to $124,999	CC	—	0	0.9	6.8
$50,000 to $74,999	DC	—	0	0.5	2.1
$35,000 to $49,999	DD	—	—	0.2	0.3
$20,000 to $34,999	EE	—	—	0	0
$10,000 to $19,999	FF	—	—	0	0
$5,000 to $9,999	GG	—	—	0	1.0
Up to 4,999	HH	—	—	—	—
	NR				
	NL				

Note: For CC-rated customers, read as follows: Last year there were no credit sales to accounts rated CC1. All credit sales to CC2 accounts have been collected. But 0.9 percent of sales to CC3 accounts and 6.8 percent of sales to CC4 accounts have been written off as uncollectible.

If limits are relaxed for particular credit-rating cells, the credit manager gives priority to buyers of high-margin goods.

Progressive liberalization is theoretically defensible until the expected values of additional losses and of additional profit contributions are equal. This principle, however, encompasses all costs, not just collection expenses and nonpayments. Relevant total costs include possible harm to high-quality customers from low-rated competitors. If the company extends credit to the latter, there could evolve a trading-down without permanent increase in overall revenues. Hence, before formulating financial policies affecting customers, even a liberalization of credit eligibility, astute credit managers consult the director of marketing.

Marketing

Some marketing executives fit the old stereotype of seeking immediate sales regardless of credit risk and eventual repercussions. Marketers, typically, do not. They are profit-oriented, according to financial vice-presidents interviewed for this study.

Nevertheless, respondents say, disputes between credit and marketing about approval of hard-won orders cause more acrimony than any other issue. Certainly, it is very wasteful and frustrating to cultivate prospects or solicit customers and then have the credit department refuse standard terms. It also causes ill-will among rejected buyers, each of whom the salesperson idolizes as a potential General Motors. Yet relatively few companies have eliminated this structural conflict. Shrewd exploitation of credit data is the key.

One of the most effective procedures is advance identification and clearance of prospects. The basic source is a computer tape from a credit directory's listings with Standard Industrial Classification (SIC) numbers of the industries to which the company sells. A printout of number of firms is distributed on a chart like Table 1, showing total prospects in pertinent SIC categories. By subtracting present customers from these total prospects, the company finds the number of SIC-relevant nonbuyers. It selects the nonbuyers with attractive credit ratings for cultivation.

By prior arrangement with the sales department, the credit manager gives each salesperson a list of prospects in his/her territory. All leads on that roster have advance credit approval for their first order. The rosters also serve the direct-mail and telephone solicitation departments as they support a sales campaign.

Such precleared leads are especially valuable to a sales force that introduces new products or opens new territories. The marketing research department estimates sales potentials of these approved prospects. In turn, marketing management decides whether and where new tactics or efforts are worthwhile.

A control approach, which enlists the same analytical framework, will be mentioned briefly. A set of entries summarizes credit requests denied during the past fiscal

year. A marketing research analyst annualizes the refused orders. Then the credit manager and the director of marketing evaluate present policies. They estimate incremental costs and contributions, plus other ramifications, as noted above. Finally, they change or reaffirm the credit policies.

In these and other ways, Table 1 is a useful format for providing information to credit and other functions. For example, some companies use the credit-ratings distributions by SIC categories as supplementary input for finding or appraising merger candidates. A more common use is in procurement.

Procurement

Purchasing departments need many of the same kinds of data and techniques as credit. The financial strength of vendors is important. Some companies seek large suppliers. Bigness may correlate with dependability in quality, delivery, and continuity. It also enables the vendor to carry the smaller purchaser. The large supplier may even be a source of additional financing.

Other buyers, especially larger companies, try to spread orders among small vendors. As key customers they get preferential treatment. Small vendors often have superior capability to fill odd requests from research and development. There are also social pressures to favor small business. Thus, regardless of preference, information about financial strength of vendors is useful.

For example, the overall credit appraisal symbol indicates ability to keep a concern going. A rating in the fourth column, for instance, raises doubts as to whether the vendor's own sources will continue supplying materials and components.

A series of summary charts in the format of Table 1 show the distribution of vendors according to estimated financial strength and overall credit appraisal. The purchasing department decides what tabulations it can use. Examples are number of vendors, annual dollar purchases, performance indexes, and prospective vendors in a particular Standard Industrial Classification code.

If desired, the purchasing agent can modify Table 1 by placing all credit ratings into rows, with columns demarcating number of years in business, which is another indicator of permanence. Thus credit research supplements data from purchasing department files and directories.

Conclusions

When the credit department shares its information with other departments, the entire company can benefit. A standard form such as Table 1 provides a useful classification for many needs, as has been shown. Other virtues of a uniform format are economies in data collection and programming plus a tie-in of related reports.

Of course, credit managers cannot violate any commitments of confidentiality to informants. Moreover, generation of information is not costless. Use of any tool requires justification in demonstrated net advantages to the company above alternative commitments of personnel time and other resources. The tool described here is efficient and effective. Data compiled for other purposes will strengthen a company's financial, marketing, and procurement functions. Moreover, internal harmony will be promoted.

(Continued from p. 8)

Conclusion

Although a strong case may be advanced for a well-balanced carrier marketing program as an important strategy for attracting and retaining market share, the results of this study strongly suggest that carrier organizations can stress all of the dimensions of the transport service mix but on a more selective basis. Carriers must anticipate both short- and long-term shifts in the demand for transportation services and respond with a strategic plan designed to successfully adapt to the ever-changing needs of customers. A deliberate strategy of segmentation permits a more efficient marketing effort of the carrier's service dimensions across customer segments.

An understanding of freight markets and their interface with marketing should enable carriers to compete more effectively on both an intramodal and an intermodal basis. However, before the findings of this study can be operationalized, additional research is needed into customer market segments, carrier marketing strategies, and the role of transportation regulation as either facilitator or inhibitor of carrier marketing activities. One can hope that current and future research endeavors will offer additional insight into the viability of market segmentation as a marketing strategy to meet the needs of freight markets.

THE USE OF PRIVATE JUDGES AS AN ALTERNATIVE TO COURTROOM LITIGATION

*Paul Lansing and Cathy R. Jones**

The Congestion in Our Court System

The number of disputes being taken to court has increased twofold in the last decade, and our court system has had problems handling the heavier caseload. Our federal and state court systems are small in comparison to the legal profession itself, which consists of about 455,000 attorneys. There is only one federal judge for every 1,000 attorneys in the United States, and federal district court judges typically handle an average of 454 civil and criminal cases a year. Although the workload of the court system has increased tremendously, there has been no comparable increase in the number of judges or other court resources. The result of this inadequate court system is a huge backlog of cases pending trial, which has resulted in long delays for businesses seeking civil litigation.

The well-known AT&T case is one example of the problem. The massive antitrust suit brought by the government against AT&T has now been in the courts for over six years, and just recently a settlement has been proposed. IBM has suffered similar delays with the court system in the antitrust suit brought against it by the government that was commenced in 1969. Barring an out-of-court settlement, the earliest possible district court ruling is not expected before 1982. Regardless of the outcome, the judge's decision will undoubtedly be appealed eventually to the United States Supreme Court, which will extend the final settlement date at least two or three years.

The Fifth Amendment to the United States Constitution guarantees "due process" to citizens attempting litigation in the judicial court system, and the right to a speedy trial has been established on the basis of this broad guarantee. However, the court system as it exists today is a far cry from the due process our forebears had in mind years ago. This is evident in view of the failure of our judicial system to serve the purpose for which it was created—to provide litigants with a fair and efficient resolution of their disputes. This failure is due to the huge backlog of cases present and the delay which results from this congestion.

Litigants including private individuals, public institutions, and corporations alike have found themselves at the mercy of our inefficient system of justice. The delay has proven to be a hardship associated with resolving a dispute in court. The most visible example of hardship occurs in the typical personal injury case where the plaintiff is not in a position financially to await the outcome of a long, drawn-out procedure. Here, delay may force a settlement on terms unfair to the claimant.

Other litigants such as corporations also suffer hardships from delays, even though they may be financially able to wait out the judicial process. These hardships include, first of all, the burden of preparing a case for trial. The time and cost associated with the investigation prior to trial is quite substantial, along with the high cost of attorney's fees. Secondly, the uncertainty present can also be viewed as a cost. It is not unusual for legal technicalities to arise which postpone the resolution of the case even further. The uncertainty present during this time also has a detrimental effect on the normal operations of the company. And thirdly, the delay in the court system may also discourage settlement. Since the resolution is not pending, there is no pressure on the parties to settle. On the whole, the court system has become a very inefficient dispute-resolution mechanism for individuals and businesses desiring a speedy but accurate decision.

There does not seem to be any immediate solution to the courts' present caseload problems. The courts are overworked and underfinanced and are incapable of expanding in order to offer judicial services to the large number of claims which exist. The federal legislature has recognized the judiciary's problem and therefore has attempted to shorten the delay in getting criminal cases to trial by passing the Federal Speedy Trial Act in 1976. This act gives scheduling priority to federal criminal cases. However, in alleviating the delay problem for criminal cases, the legislature has worsened the situation for civil cases. Now civil cases are given lower priority and suffer even longer delays before coming to trial. It appears that in order to solve the court congestion problems, alternatives to the judicial system will be inevitably necessary, since the court system itself has been unable to improve its efficiency.

The Use of Alternatives to the Present Court System

Faced with this problem, businesses currently do have the option of using various judicial alternatives to the court system. One alternative form of dispute resolution is arbitration. Under this system, the parties mutually agree under a contract to submit their matters of difference to selected persons (known as arbitrators) for determination. The decision of the arbitrator(s) is to be accepted as a

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substitute for the judgment of a court and is therefore binding on the parties. An essential element of this procedure is that the parties must agree to this form of resolution before the dispute arises. When this procedure was initially developed, many courts leaned strongly against enforcing arbitration agreements as tending to oust the courts from their lawful jurisdiction by private agreement. The courts felt they would lose much of their power, since private individuals would be deciding legal as well as factual issues and therefore, in effect, making law. Because arbitrators derive their power from the parties and the terms of the agreement, they may have power greater than that of judges, since arbitrators are not necessarily required to follow the rules of law, whereas judicial officers fall under the court's discretion, rules, and control. Therefore arbitrators may intentionally decide contrary to law and still have their judgment stand.[1] In considering the possibility, the courts were hesitant to give up a part of their exclusive jurisdiction to these private lawmakers. A similar type of controversy arose when administrative agencies were initiated and began to gain some power and freedom from the courts. However, in some states arbitration was looked upon favorably as a means of promoting tranquility and the prompt and equitable settlement of disputes. Since the enactment of the arbitration statutes, beginning with New York in 1921, the courts have generally looked with favor on arbitration as a shortcut to substantial justice.[2]

A second alternative form of dispute resolution is mediation. Mediation of a dispute has been described as the intercession of an impartial third-party person in a dispute for the purpose of assisting the parties to resolve their differences voluntarily. The ultimate goal of mediation is to assist disputants to arrive at their own agreement. Mediation is more active then conciliation and goes beyond the simple catalytic agent stage. When occasion demands, a mediator is interjected into the discussions and makes affirmative suggestions and recommendations for developing areas of possible agreement on the issues involved in the dispute. Although mediation is often associated with the process of arbitration, an important difference exists between the two. In mediation, the final decision made by the mediator is not binding on the parties, whereas in arbitration the parties have agreed to accept the arbitrator's decision as binding on them. This distinction reveals the greater power and authority which exists in the arbitrator's position as compared to that of a mediator. The fact that a mediator's recommendations are not binding on the parties suggests that it is an inadequate alternative to the court system in most cases, and therefore it is not proposed to be an important solution to the caseload problem we are concerned with.

Recently, however, another alternative to resolution in the courts has been advanced. It is a system which employs the use of a "private judge" to resolve matters outside of the regular court system. This system is based upon the old practice of referring matters of a long or complicated account, a practice that began in the American colonies under Dutch jurisdiction. During the period of Dutch colonization, the practice of referring matters became a common form of trial. However, as English influence began to prevail when these colonies came under English jurisdiction, trial by jury was substituted in most law actions. Subsequently, statutory authority was enacted in some of these jurisdictions authorizing reference in any common-law action.

This authorization was the origin of a California statute passed in 1872 which presently gives a court the power to appoint a referee who may decide any or all issues of fact and of law pertaining to a particular case.[3] Relying on this old statute, the California courts first allowed the use of a private judge in 1976, and have since approved its application in a number of probate, divorce, and business disputes. This system has been used for the resolution of the dispute between the nation's largest oil companies and the California Air Resources Board, the lawsuit between the National Broadcasting Co. and Johnny Carson, and the case between ILC Steinthal, Inc., and General Motors and its distributors concerning pickup truck tarps. In these cases, the Superior Court of California has allowed private individuals to be rented out to litigants who do not want to spend the time and/or money which is involved in a court trial.

How the System of Private Judges Operates

In order to obtain this type of private trial, the parties must mutually choose their own judge and then petition the court for an order of reference. The trial is then held at the convenience of the parties, who may determine the location and time of their meetings. The flexibility in this method is a definite advantage over the rigid scheduling of court trials now in use. It benefits not only the parties but also the attorneys, witnesses, judge, and all others involved in the proceeding. Tailoring the procedure to meet the needs of the parties undoubtedly reduces the tension which may exist and fosters an open climate during the proceedings. In sum, the aggravation involved in court proceedings is greatly reduced using the private judge system.

The fees for judicial services have been set in the free market and range anywhere from $25 to $300 per hour,

[1] *Leslie v. Leslie*, 50 N.J. Eq. 103, 24 A319, p.319.

[2] *Solari v. Oneto*, 166 Cal. App. 2d 145, 333 P. 2d 218 3d Dist. (1958), p. 223.

[3] California Code of Civil Procedure, sec. 638: "A reference may be ordered upon the agreement of the parties filed with the clerk, or judge, or entered in the minutes or in the docket: (1) To try any or all of the issues in an action or proceeding, whether of fact or of law, and to report a finding and judgment thereon. (2) To ascertain a fact necessary to enable the Court to determine an action or proceeding."

depending on the skills and demand for the judge's time.[4] Since private judges will want to be selected in subsequent matters, they can be expected to treat the attorneys and parties fairly. Judicial excellence is encouraged, because the increased demand for the more qualified private judges allows them to increase their hourly salary.

One major criticism which has been aimed at the regular court system has been the lack of competence and specialized knowledge of the court. In many business litigation cases, the facts and legal issues litigated can become quite complicated due to the increasing level of technology involved today. The legal arguments are usually framed in technical jargon, and it is difficult to rephrase them in laymen's terms. Therefore, the average jury members and even the highly educated and experienced judges in the typical courtroom may find themselves unable to deal with the issue presented to them. However, this new system of private judging is not subject to this problem, since the parties are able to select their own judge. They are able to choose a judge with specialized knowledge and experience in the area under litigation and thus insure greater acceptance of the decision. Unlike the judge presiding in court, who is pressured to reduce a staggering caseload, the private judge is allowed enough time to fully hear and resolve the issues. Not occupied by a variety of cases dealing with a number of different areas, the private judge is able to concentrate on the specific subject at hand. These advantages of the private system will undoubtedly affect the quality of the decision obtained and lessen the likelihood of appeal.

Another important advantage of the private judge system is its privacy. All the proceedings, documents, and evidence are kept confidential between the parties and the judge. This is a big advantage in controversial or private matters such as divorce proceedings or complicated business litigation. The only evidence made public is an order for a private judge and the final decision. The trial does not get publicized in the media and therefore does not attract attention. The procedure is quick and quiet.

There also exists a greater chance of settlement under the private judge system. The procedure used in the court system is much more formal and therefore allows the parties to disguise their intentions. There may be numerous delays, and various motions and exceptions may be filed which serve to postpone the final resolution of the case. The tendency is to put off making any concessions or settlements because they may be seen by the opposing side as a weakening of confidence in one's original position. Each side is uncompromising, and at this point a settlement is not likely. This situation may be contrasted, however, with the private judge system. The more informal atmosphere allows the parties to be more open with each other. The desire is to get the dispute out into the open and get it resolved quickly as possible. Therefore, if the parties see an end to the proceedings, they will be more willing to consider a settlement.

Differences Between Referees and Arbitrators

On the surface, the system of selecting private judges to hear matters outside of court seems to be quite similar to the system of arbitration. However, in actuality the two are distinguishable in a number of important respects. First of all, the authority of the arbitrator is derived not from the courts but from the contract of the parties and terms of their agreement.[5] On the other hand, the private judge derives judicial authority from the courts and is deemed to have powers identical to those of public judges. The factual and legal determinations of the private judge are conclusive and binding on the parties, and the judge's decision can be set aside only on account of fraud or gross error of law or fact. The proper and only manner in which to attack the findings of a referee is by making a motion for a new trial. Since the power to attack a finding made by a private judge is equal to the power to attack a finding made by the court, the same rule applies.

Secondly, the private judge system follows the procedure of the court system, thereby allowing the litigants to maintain claims and defenses without running the risk of unwanted compromises, which may be expected in binding arbitration. Arbitration deliberately avoids adherence to the governmental court rules of evidence and civil procedure, making appellate review virtually impossible. Binding arbitration does not recognize the slight distinctions which may make the difference between valid and frivolous claims or defenses in court litigation. Persons submitting to binding arbitration must rely upon the arbitrator's sense of justice or interpretation of the agreement. The private judge system lies somewhere in the middle ground between the public court system and arbitration. In this unique position, it gains some of the advantages of each: the protective rules of procedure and evidence found in the courtroom and the flexibility and efficiency found in arbitration. The combination is a definite advantage to those seeking the resolution of a dispute.

The Judicial Response to Private Judging

A limitation to the use of the private judge system lies in the current judicial response to it. Whereas arbitration is presently looked at quite favorably by the courts, the same is not true for the referee system. The courts have been reluctant in allowing cases to be tried in this manner. The courts have stated that references are to be allowed only under extraordinary circumstances, and the courts' policy is definitely against their use.[6] According to the

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[4]Carl E. Person, "National Private Court: A Proposal for a Free-Enterprise Court System," *Urban L. Ann.* 7 (1979): 351.

[5]*Park Construction Co. v. Independent School District*, Sup. Ct. of Minn. (1943), 11 NW2d 649, p. 652.

[6]*Edwin L. Carpenter v. Robert G. Bloomer and Edith S. Bloomer*, 148 A. 2d 497, 54 N.J. Super 157 (1959), p. 500.

American Bar Association, no state except California has permitted private judges under a similar statute relating to references. It is possible, however, that the courts are merely reacting to the loss of power as they did when faced with the development of arbitration and administrative agencies. If this is the reason for their reluctance, it is possible that given the time, their attitude may change.

The Issue of Equity in Private Judging

A public policy issue concerning the system's use has arisen from critics of the private judge system. They question the fairness of the practice based on the premise that people who can afford to hire a private judge will have better access to a quick trial than others. Access to the courts is a basic fundamental right derived from the guarantees of due process and equal protection contained in the Fifth and Fourteenth Amendments to the Constitution. Due process demands that a person must be granted the opportunity to be heard prior to the deprivation of property and that the opportunity must be "granted at a meaningful time and in a meaningful manner."[7] The courts have not held that a classification based solely on wealth is suspect for purposes of equal protection analysis. When wealth is coupled with the denial of a fundamental right, however, the court has looked more closely into the effects of poverty upon that right. A denial of access to the courts based upon wealth is a violation of the constitutional right to equal protection. Therefore, the system of private judging may be questioned on constitutional grounds if it is shown that the poor are actually being denied access to the courts due to inferior economic position.

Another attack on the system has been based on the egalitarian notion that all men are intrinsically equal and should therefore have equal access to the privileges of the society. This view believes that the classes in society should be leveled and everyone be entitled to equal opportunities. The private judge system is inconsistent with this view because it is not available to all people in the society. The poor are restricted from its use by its cost. Allowing the system to function would in effect be promoting the establishment of two separate systems of justice—one for the economically inferior and the other reserved for the wealthy. Social justice would not be satisfied, because the presently inadequate and inefficient court system would not be improved but would merely be allowed to function as it is for those who cannot afford something better. Others, however, escape the public policy issue by looking at the private judge system as a product being offered in the free marketplace. They see it as being similar to any other service in that it is available to anyone wishing to pay its price. This inequity in our democratic society, however, seems to be more acceptable in the marketplace than in our judicial system.

Conclusion

The current condition of our court system has caused it to fail, in some instances, in its Fifth Amendment guarantee of due process. Litigants are presently not receiving adequate judicial services and are burdened with the hardships arising from the congested court system. These hardships include the substantial costs, time, and uncertainty which accompany a court battle. The judiciary itself seems unable to solve these overload problems, and therefore attention has been turned to searching for viable alternatives.

A number of alternatives have been proposed. Arbitration, under which parties mutually agree to submit their matters of difference to selected persons for determination, has been very popular in industrial and labor disputes. The system of arbitration offers many advantages, including a much more informal procedure involving less time and money; however, it does not follow the procedure of the court system in its rules of evidence and civil procedure. Arbitration may not be acceptable to someone seeking a more formal resolution similar to that of the court system. Mediation has also been proposed as an alternative and may be appropriate in certain types of disputes, but since a mediator's recommendations are not binding on the parties, a final resolution is not guaranteed. Therefore, it is not an appropriate alternative in many circumstances. It appears there is a need for a system which has all the characteristics of the court trial except that it performs in an efficient manner.

The system of private judging appears to fulfill this need. It is a system which resolves matters outside of the regular court system and employs the use of a private judge or referee. The advantages to this system include specialized expertise, privacy, reduced cost and time, and greater flexibility. It also follows the procedure of the court system, which provides less uncertainty than arbitration. The private judge system seems to lie somewhere between the court system and arbitration and may therefore gain some of the advantages of each.

It is felt that this proposed alternative system should be allowed to develop and should be given more of an opportunity to prove itself. It will then be possible to judge its performance to decide if it fairly resolves disputes in a more efficient manner than our present court system.

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[7]Dawn Tilman, "The Constitutional Right to Access to the Courts for Indigents: An Inconsistency in California Law," *SFV L. Rev.* 8: 100-101.

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AN OVERVIEW OF DEMARKETING AND THE PETROLEUM INDUSTRY

*M. A. Turk and C. L. Abercrombie**

Demarketing of the U.S. petroleum industry has affected the world—but especially Americans—in a profound way. It has changed the very fabric of the American way of life. Although the subject is complex, this article attempts to explain the fundamentals of oil demarketing and its effects by dividing the subject into five sections. The first section defines demarketing and the general strategies and tactics used by marketers when demand exceeds supply. Next is an exploration of factors that led originally to shortages in the supply of oil. Third, this article compares the "demarketing mix" of oil companies with the general strategies and tactics listed in the first section in order to determine how thorough the oil industry has been in utilizing these important steps to discourage consumption. Examples will also show how demarketing has affected two major oil companies' sales, profits, and R.O.I. from 1972 (the year before demarketing) through 1978 (five years after demarketing began). The fourth section examines how demarketing has affected the consumer. Finally, the article reviews important actions the government has taken during the demarketing of such a vital industry.

Demarketing: Definition and Strategies/Tactics

The source of this article's definition of demarketing is a classic article authored by Philip Kotler and Sidney J. Levy entitled "Demarketing, Yes, Demarketing." The authors point out that many people narrowly define marketers' activities as those which increase demand. Those who hold such a limited view assume that there is always a "buyer's market" (one in which the supply of goods or services is greater than their demand). However, as will be shown concerning the oil industry, conditions may exist where demand exceeds supply. This may seem like an enviable position, but it can be just as problematic as the opposite condition, as the authors point out in their definition of demarketing:

> A company faces a host of difficult customer-mix and marketing-mix decisions in periods of excess demand. It has to find ways of reducing total demand or certain classes of demand to the level of supply without damaging long-run customer relations.
>
> Our name for this kind of activity is "creative demarketing." More formally, we define demarketing as that aspect of marketing that deals with discouraging customers in general or a certain class of customers in particular on either a temporary or permanent basis.[1]

Kotler and Levy recommend seven strategies/tactics to encourage deconsumption. These are:

1. Curtail advertising expenditures for the product, modifying the content of the messages.
2. Reduce sales promotion expenditures. . . .
3. Cut back salesmen's selling time on the product . . . asking them to concentrate on other products. . . .
4. Increase the price and other conditions of the sale to the advantage of the marketing company.
5. Add to the time and expense necessary for the buyer to procure the product or service—what might be called his "effort and psychological costs"—as a means of discouraging demand.
6. Reduce product quality or content. . . .
7. Curtail the number of distribution outlets, using the product shortage as an opportunity to eliminate undesirable dealers and/or customers.[2]

The strategies/tactics listed above are fundamentals for encouraging deconsumption. In the third section of this article, examples of the demarketing mix of oil companies are compared to these seven points to show the thoroughness of their demarketing efforts.

Factors That Led to Shortages in Oil Supplies

Americans were simply consuming more petroleum than the oil companies could produce with their existing refining capacity. "The demand for gasoline [had] been rising steadily . . . from 66.3 billion gallons in 1962 to 102.6 billion gallons in 1972."[3] This 54.8 percent increase in demand was essentially due to the affluent habit of driving inefficient cars longer distances and an increase in the number of automobiles and automobile ownership.

In their brilliant article entitled "Shortages and Gasoline Marketing," authors James M. Patterson and Fred C. Allvine continue this analysis by stating: "Between January 1961 and January 1971, U.S. refining capacity [had] been increased by only 24.6 percent—less than half as much as demand [had] increased. In 1972, while demand was increasing by 7 percent, capacity grew only 2.2

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[1]Philip Kotler and Sidney J. Levy, "Demarketing, Yes, Demarketing," *Harvard Business Review*, November-December 1971, p. 73.

[2]Ibid., p. 74.

[3]James M. Patterson and Fred C. Allvine, "Shortages and Gasoline Marketing," *Business Horizons* 17 (April 1974): 7.

percent."[4] Considering that increases in demand for heating oil and gasoline were very predictable, the authors present three theories for such low refining capacity:

(1) [It was] part of a conscious decision by the major oil companies to get rid of excess refining capacity in order to eliminate the competition of independent price-marketers . . . to raise prices in order to generate the funds necessary for the massive capital demands faced by the industry over the next ten to fifteen years.

(2) The countertheory advanced by the oil companies [was] that confused and uncertain public policies (i.e., environmentalist opposition to refinery location, uncertainty over rules regarding use of lead additives to raise octane ratings, oil import policy, etc.) [had] made long-term extensive investment in refining capacity unattractive. . . . What kind of refinery to build and where to build it depend upon the answers to these key uncertainties.

(3) Still others argue that the shortage was a planning mistake.[5]

It is evident that a shortage in petroleum was inevitable. Demand was growing more than twice as fast as the supply of refined oil. However, one event, which no one could have planned for, occurred to reduce the total world supply of oil—an oil embargo by OPEC. The authors explain this event as follows:

> In October 1973, the whole prospect changed. The threatened gasoline and heating oil shortage now became real as the Arab members of the Organization of Petroleum Exporting Countries (OPEC) imposed an embargo in those nations (including the United States) that had shown insufficient enthusiasm for the Arab cause in the October War. This embargo was compounded by the simultaneous programmed cutback of crude production, which further reduced the free world's supply of crude and thereby reduced the chance that third-party transactions could bypass the embargo.[6]

Thus, increasing demand by consumers and cutbacks in oil supply by OPEC and U.S. refineries created what can be termed "The Demarketing Era in the Petroleum Industry."

The Petroleum Industry's Demarketing Efforts

To determine the thoroughness of petroleum demarketing efforts, this article categorizes Kotler and Levy's seven strategies for demarketing into their respective demarketing mix elements of product, price, place, and promotion. Next, examples are given of oil company demarketing mix strategies as a basis of comparison.

[4]Ibid., p. 8.
[5]Ibid., p. 6.
[6]Ibid., p. 5.

Effect on Product

Kotler and Levy's recommendations included "reduce product quality or content" and "add to the time and expense necessary for the buyer to procure the product or service—what might be called his 'effort and psychological costs'—as a means of discouraging demand."

Examples of reduction of product quality or content are clearly visible in the petroleum industry. Texaco has begun marketing "gasohol"—a mixture of gasoline and alcohol—in a number of states in order to stretch gasoline supplies. Oil companies tried reducing product quality by lowering octane ratings until the FTC made them post their ratings at the pump. Another way oil companies have tried to reduce the content of gasoline is by adding gasoline additives like MMT. "The industry estimates that the use of MMT extends gasoline supplies by up to 6%."[7]

Oil companies also added an intangible factor to gasoline that the authors call "effort and psychological costs" to discourage demand. "By early summer of 1973, Texaco, American, Gulf, Sun, Shell, Exxon, Phillips, Mobil, Union, Arco, and Citgo began to ration gasoline to their dealers—some to as little as 80 percent of the 1972 levels."[8] The petroleum industry also reduced allocations to airlines in order to devote more of their supplies to heating oil for the winter of 1973. The "psychological costs" added to gasoline as a result of these measures are illustrated in the following excerpt, which describes the holiday season of 1973:

> Students at colleges throughout the country who had flights home cancelled, complained of treatment at their school's ride boards, "they treat you as if you're being hired for a job or something." . . . People who had more time off had less to do. . . . The places to go were still there but the ways to get there weren't.
>
> As the lines at the pumps grew longer, nerves became frayed. In Brooklyn, customers followed up the early lead of truckers and tussles with station attendants . . . were reported.[9]

Effect on Price

Another recommendation made by Kotler and Levy was to "increase the price and other conditions of the sale" as a means to reduce demand. This is the most visible of the demarketing mix strategies that have come under fire by consumers. Patterson and Allvine reported that OPEC, "in conjunction with the major international oil companies, raised the price of Arabian crude landed in New York from $3.47 per barrel in August 1973 to $9.13 in December of the same year."[10] By March 30, 1981, the price of oil was approximately $32 per barrel. *This is an alarming increase of 822 percent since August 1973, the year demarketing began.* Fortunately (if one can say that),

[7]"A Surging Thirst for Gasoline," *Business Week*, Sept. 4, 1978, p. 71.
[8]Patterson and Allvine, p. 5.
[9]"The Shortage: What Ticks Off John Doe," *National Petroleum News* 66 (February 1974): 36.
[10]Patterson and Allvine, p. 12.

prices at the pump have not risen to the same extent, due to government price controls prior to enactment of decontrol this year. Gas prices at the pump were roughly 35 cents per gallon in 1973, before demarketing, compared to an approximate price in April 1981 of $1.35 per gallon—an increase of 286 percent since demarketing began.

Gas prices will most likely continue to increase, due to decontrol and states seeking higher gasoline taxes. Murray Weidenbaum, chairman of the President's Council of Economic Advisers, "estimated that about six cents of the 8.4-cent increase in average U.S. gasoline prices last month [February 1981] was the result of President Reagan's decision to decontrol U.S. oil and gas prices at the end of January."[11] As for states increasing gasoline tax, the verdict is: "At least 40 states are trying to raise gasoline taxes this year [1981]."[12] Florida Governor Robert Graham sums up the issue with this analysis: "The crux of the problem is that with gas prices going up, driving is going down, along with our tax revenue. At the same time, the cost of maintaining roads is skyrocketing, meaning we have no choice but to increase the tax."[13]

Especially from the above quotation, one can see how increasing the price variable of the demarketing mix has certainly decreased demand for driving. And with higher prices as the result of decontrol and gas tax increases, consumption might continue to decline.

Effect on Place (Distribution)

It will be recalled that Kotler and Levy recommended two distribution strategies for decreasing demand in a product shortage: first, "curtail the number of distribution outlets . . . to eliminate undesirable dealers and/or customers," and second, "cut back salesmen's selling time on the product . . . asking them to concentrate on other products." Although the latter strategy might be considered a promotional variable, the ultimate salesman in the oil industry is the service station owner or manager who is a retailer selling directly to the ultimate consumer. Thus, for this analysis, this second strategy will be considered a distribution variable.

An excellent example of how distribution was used to increase the *major* oil companies' share of market over the independent marketers and refiners(who are considered as undesirable customers by major oil producers due to their competitive gas prices) is skillfully analyzed by Patterson and Allvine as follows:

> Once there was a shortage . . . the big majors merely cut off interrefinery sales of gasoline to the buffer companies (smaller majors and independent refiners) who traditionally sold gasoline to the price marketers. . . . By mid-1973, the independent refineries were operating at less than 70 percent capacity because of insufficient feedstocks. This was at a time when the majors were running at 95 to 105 percent of capacity.
>
> The strategy of focusing the shortage worked. By October 1973, the major brand share of the market was up nearly 7 percent while the nonmajors were down nearly 4 percent.[14]

The oil companies enforced the second strategy—to cut back the selling time of gasoline and concentrate on other products—in order to try to decrease gasoline demand while making higher profits. An example of this practice was reported in the *Wall Street Journal* on March 30, 1979, as follows:

> Service stations across the country are trimming their hours and closing on Sundays. . . .
>
> Station owners say the situation is exacerbated by consumers, who, remembering the long gasoline lines during the 1973-74 oil embargo, are "topping" or keeping their tanks constantly full. . . .
>
> A Florida dealer [said], "Maybe the Sunday closings will remind motorists to conserve fuel and the problem will go away completely."[15]

Oil companies also encouraged dealers to promote other products, as recommended by Kotler and Levy, referred to as T.B.A. (tires, batteries, and accessories) during the years. This will be seen in the next section under promotion.

Effect on Promotion

The authors, as previously mentioned, also recommended two promotional strategies to practice when demarketing: "curtail advertising expenditures for the product, modifying the content of the messages," and "reduce sales promotion expenditures." The reason for these strategies is obvious. As applied to the oil industry, if there is not enough gas, why encourage demand? Promotional messages are used now to persuade the consumer to conserve gasoline, to "push" other products (tires, batteries, and accessories), or to enhance corporate image.

Examples of reducing advertising expenditures, changing the content of promotional messages, and eliminating sales promotion are numerous. Below is just one excellent example, reported in *Advertising Age* in 1973:

> Gasoline advertising across the United States has become scarcer than the product itself.
>
> In giving its grimey gasoline salesman, Mr. Dirt, an indeterminate vacation, Mobil Oil is the latest major gasoline supplier to announce an advertising hiatus since refineries across the land began selling every drop they can produce.
>
> Further advertising, according to a Mobil spokesman, would only aggravate consumers and dealers

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[11]"Consumer Prices Increased by 1% During February," *The Wall Street Journal*, Mar. 25, 1981, sec. 1, p. 3.

[12]Bill Paul, "Paying More for Gasoline Is Likely as States Press for Increased Taxes," *The Wall Street Journal*, Mar. 24, 1981, sec. 2, p. 23.

[13]Ibid.

[14]Patterson and Allvine, p. 15.

[15]"Gasoline Stations Are Trimming Hours But Dealers Insist Supply Is Sufficient," *The Wall Street Journal*, Mar. 30, 1979, sec. 1, p. 6.

faced with shortages. A Getty Oil spokesman echoed the Mobil exec's feelings. The hiatus also extends to product promotions at the point of sale. "The glassware and knife giveaways are out as well," the Mobil man said. "They're only good when you want to be competitive."

In second-half spending, all gasoline marketers spent about $60,000,000 in 1972. The media fallout for 1973 has been estimated at between $30,000,000 and $40,000,000. . . .

Exxon, Amoco Oil, Texaco and Gulf have previously cut out gasoline advertising. [An Exxon spokesman said] "We're in a much better situation than other companies because we have 10 corporate tv commercials running." . . . Radio commercials for gasoline, he added, have been replaced with spots promoting the sale of tires, batteries and Exxon Value Centers through dealers. . . .

Shell Oil Co. . . . will break a conservation campaign June 25.

Phillips Petroleum Co. . . . presently is running ads on fuel conservation, and said it has no plans to change this strategy.[16]

Effect on Sales, Profits, and R.O.I.

From these examples, it is obvious that the oil industry has adopted Kotler and Levy's strategies/tactics to demarket petroleum products. A logical question is, How has this strategy affected oil companies' sales, profits, and R.O.I. (return on investment)? To determine the answer, the authors selected two major oil companies of *different* size proportions for analysis: the Exxon Corporation and Phillips Petroleum Company. The time frame for analysis is from 1972 (the year before demarketing) through 1978 (five years after demarketing began). The source used was *Moody's Industrial Manual,* volumes 1 and 2 for 1979. Selected figures for sales, total assets, net income after taxes, profit margin percentage, and R.O.I. percentage are shown in Table 1.

Exxon sales have increased 189.2 percent versus Phillips' sales increase over the same six-year period of 178.5 percent. Both have also increased asset expansion a good deal. Exxon has increased assets over this six-year period 92.6 percent versus Phillips' expansion of 112 percent. The big differences between these "majors" is reflected in their profit and R.O.I. percentages. Exxon's best year for profit margin was 1973—the year demarketing began. Its profit margin grew to 8.61 percent for that year but has declined until 1978. In addition, its R.O.I. percentage has followed the same course as its profit margin percentage. It increased during the first year of demarketing to 9.77 percent but has declined every year until 1978. This may be attributable to such factors as investing in oil exploration and acquisition of some unprofitable firms. By contrast, Phillips Petroleum's profit margin and R.O.I. percentage have been somewhat erratic but made strong gains from 1976 to 1978. In fact, its best profit and R.O.I. percentages were recorded in 1978, at 10.15 percent and 10.24 percent, respectively. This performance may be due to the fact that Phillips Petroleum divested itself of marketing outlets (service stations) from 1972 to 1978. As reported by *Moody's Industrial Manual,* the firm had 23,678 stations in 1972 versus its 1978 total of 13,638. Thus funds derived from the sale of these stations may have placed the firm in a better financial position, but this is only speculation.

Table 1

Exxon Corporation

Year	Sales ($000's)	Total Assets ($000's)	Net Income after Taxes ($000's)	Profit Margin %	R.O.I. %
1972	22,436,000	21,558,257	1,559,000	6.95	7.23
1973	28,476,000	25,079,494	2,451,000	8.61	9.77
1974	45,793,000	31,154,489	3,030,000	6.62	9.73
1975	48,760,592	32,839,398	2,503,013	5.14	7.62
1976	52,584,821	36,331,346	2,640,964	5.02	7.27
1977	58,460,505	38,436,949	2,443,110	4.18	6.36
1978	64,886,039	41,530,804	2,763,000	4.26	6.65

Phillips Petroleum Company

Year	Sales ($000's)	Total Assets ($000's)	Net Income after Taxes ($000's)	Profit Margin %	R.O.I. %
1972	2,512,742	3,269,619	148,428	5.91	4.54
1973	2,989,952	3,848,414	212,241	7.10	5.52
1974	4,980,704	4,249,597	402,138	8.07	9.46
1975	5,133,557	4,747,547	342,568	6.67	7.22
1976	5,697,516	5,247,580	411,656	7.22	7.84
1977	6,284,185	5,836,503	516,902	8.22	8.86
1978	6,997,782	6,935,359	710,479	10.15	10.24

Source: *Moody's Industrial Manual,* vols. 1 and 2 for 1979.

[16]"Mobil Latest to Slash Gas Ads, Cuts May Reach $40,000,000," *Advertising Age* 44 (Jan. 25, 1973): 1.

The most important point to make about analyzing these figures is that one should not make hasty conclusions about oil industry profits. Exxon's net income after taxes of $2,763 million in 1978 does sound like a great deal, but the company's profit margin and R.O.I. percentages can be low when compared to those of other industries.

Oil Demarketing's Impact on the Consumer

It has been previously noted that oil demarketing has caused consumers added gasoline expense in the form of dollars *and* "effort and psychological costs." In addition, demarketing may even mean a cost of declining values concerning environmental issues. Remember the Alaskan pipeline? As one environmentalist said, "I'm not really sure the environmental movement can survive the energy crisis."[17]

Oil demarketing has also changed driving habits. As noted previously, increased gas taxes are being considered by 40 states since decreased consumption of gasoline has affected state and federal revenues. This is mostly due to increasing use of smaller, more gas-efficient cars, which currently "represent nearly 60 % of the total unit sales of autos, including imports, in the U.S."[18]

Besides the costs mentioned above, oil demarketing has the dubious distinction of being one of the leading causes of inflation! An article in the *Wall Street Journal* on March 25, 1981, gives a clear example of how oil demarketing is inflationary:

> The Labor Department reported that consumer prices rose a seasonally adjusted 1% in February . . . after rising 0.7% . . . in January and 1% in December. . . .
>
> The department said that about two-thirds of February's increase stemmed from rising energy-product prices. When energy costs are excluded, overall prices rose an adjusted 0.3% last month.[19]

Oil demarketing also affects the inflation rate in other industries, since all goods and services either directly or indirectly use petroleum.

The Government's Impact on Petroleum Demarketing

Patterson and Allvine, in their article entitled "Shortages and Gasoline Marketing," regarded the oil shortage's effect on legislation in this way:

> The great gasoline and heating oil shortage of 1973-74—which was only threatened until the Arab embargo—did what no other argument or event had been able to do since the 1930's. It created a climate agreeable to reform of the industry. For the first time in several decades, Congress—shielded from the traditional oil interests by Watergate and prodded by an angry and disenchanted public—seemed to be in a mood to reform the structure of the industry.[20]

This "climate agreeable to reform" produced two significant pieces of legislation: the Emergency Petroleum Allocation Act of 1973 and the federal decontrol of oil prices.

The Emergency Petroleum Allocation Act of 1973 provides "all previous customers with the same proportion of the supplier's available stocks that they had during a specified base period. In a sense, it undertakes to 'share the shortage.' "[21] The intended effect, of course, is to keep major oil companies from driving independent marketers out of business by not selling them oil.

The most important piece of legislation as a result of oil shortages was the federal decontrol of oil prices. It began under the Carter administration but was fully accomplished under President Reagan on January 28, 1981. According to a Federal Trade Commission staff report:

> Until the decontrol order, a gasoline refiner or marketer's ceiling price was equal to the average price charged on May 15, 1973, plus certain allowable increases. Shortages were prevented by raising the price ceiling when the seller's costs increased, but the controls probably also caused sellers to operate inefficiently. . . . The regulation allowed oil companies to pass only certain expenses along to consumers. . . . This gave refiners an incentive to choose production methods whose costs could most easily be passed along, instead of the less-costly method.
>
> This aspect . . .[encouraged refiners] to sell others' gasoline . . . rather than buy crude and refine it themselves at lower cost. . . . The regulatory formula let them then charge more for other gasoline that actually cost less to produce.[22]

The effect of federal decontrol was that petroleum prices and profits increased as soon as decontrol was established. Murray Weidenbaum, chairman of the President's Council of Economic Advisers, "estimated that about six cents of the 8.4-cent increase in average U.S. gasoline prices last month [February 1981] was the result of President Reagan's decision to decontrol U.S. crude oil and gas prices."[23] However, because of the large revenues associated with oil decontrol, a "windfall profits" tax is included to "establish an Energy Security Fund. The fund will be used to aid the poor, to finance mass transit and to help develop a list of politically popular alternate energy projects."[24]

(Continued on page 27)

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[17]"The Shortage: What Ticks Off John Doe," p. 37.

[18]Charles J. Elia, "Detroit's Ability to Compete with Japanese Is Confirmed by Small-Car Sales, Analyst Says," *The Wall Street Journal*, Mar. 20, 1981, sec. 1, p. 45.

[19]"Consumer Prices Increased by 1%," p. 3.

[20]Patterson and Allvine, p. 5.

[21]Ibid., p. 15.

[22]"Regulations on Gasoline Prices Unfavorable for Consumers, Concludes FTC Staff Report," *FTC News Summary* 20-81 (Feb. 20, 1981): 1.

[23]"Consumer Prices Increased by 1%," p. 3.

[24]Walter S. Mossberg, "President Will Gradually Phase Out Price Controls on Crude Oil to Spur Production, Curb Consumption," *The Wall Street Journal*, Apr. 6, 1979, sec. 1, p. 3.

THE EVALUATION OF PURCHASED COMPUTER SOFTWARE

*Robert M. Brown and Kurt Stephenson**

Purchasing applications software is similar to buying a car—unless you know your needs and limitations, as well as what to look for (e.g., how to evaluate the car), you can easily end up with a "lemon." Since *purchasing* software, as opposed to developing it in-house, is becoming a widespread practice, it is necessary for the buyer to be skillful in evaluating computer software packages.

Unfortunately, companies that are more likely to buy computer software are probably less able to evaluate the software they are buying. This article is intended to be an overview of the evaluation process, and as such provides the reader with a quick reference so that important aspects of this task will not be overlooked. Detailed discussions of the numerous topics briefly discussed here are available in the references cited in footnotes. The specific topics covered in this article are:

The advantages/disadvantages of purchased software
Initial evaluation steps
Locating the appropriate software packages
Additional evaluation considerations

Note that several of the listed evaluation steps occur simultaneously, and the order in which the items are presented is not meant to imply the actual order in which the evaluation steps take place.

The Advantages and Disadvantages of Purchased Software

This section describes several *potential* advantages and disadvantages of purchased software. Since each software package differs in quality, some items are discussed under both advantages and disadvantages.

Advantages

1. Reduction of Programmer Effort: In several standardized applications (payroll, accounts receivable, and accounts payable, for example), it is unnecessary for a company to direct its programming efforts toward developing these types of programs. Software packages like these already exist in high-quality form and are readily available. When a company purchases these standard types of software from outside vendors, in-house programmers are made available to handle the nonroutine types of jobs that all companies have.

2. Cost Reduction: Due to the high costs associated with in-house development (particularly the high salary expense of programmers), it is often advantageous to purchase software. This is true because the costs of development are spread over many users. One writer estimates that the outside purchase of software will typically save 90 percent of the costs of developing a similar in-house package.[1] Others are not quite as generous in their costs savings estimates, but the general consensus is that the savings are considerable.

3. Superior Product: Oftentimes, purchased software is of higher quality and reliability than homegrown software.[2] The validity of this statement rests with the view that some of the best programmers work for software houses. However, it is not universally true that any purchased package is superior to any in-house package. In addition, purchased software might not meet the user's needs as well as software developed internally.

4. Vendor Support: Generally, the software vendor provides excellent support in the areas of training, maintenance, and implementation assistance. These are areas in which established vendors have had a lot of experience. Consequently, they have become proficient at these tasks.

5. Excellent Documentation: The documentation of purchased software *should* be better than the documentation of most in-house software. Many programmers find the production of good documentation to be unpleasant and, therefore, documentation is sometimes slighted on in-house developments. Generally, the documentation of purchased software is quite good.

6. Faster Implementation: When a company manufactures its own software, there are often programming delays while the package is being developed. Also, if a key programmer leaves the company, the software might never be completed. Thus, there is often a long lead time with in-house development. If, however, the software is purchased, implementation can occur much quicker, since the package is already complete.

Disadvantages

1. Inefficiency: Software packages are designed to be flexible so they can be modified to meet the needs of more than one user. This typically means that the software is

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[1]Ernest E. Keet, "Eliminating the Risks of Buying Software," *Infosystems*, February 1978, p. 62.

[2]Marvin L. Golland, "The Software Package: What's Best for You?" *The Internal Auditor*, June 1978, p. 64.

not as efficient as specifically designed software. However, since some needs are similar for many companies, this does not appear to be a major disadvantage.

2. Vendor Support: This item is listed both as an advantage and as a disadvantage. The disadvantage can occur if the purchaser extensively modifies the software. Most vendors will offer less support in these situations, and in some cases the vendor will withdraw all support. One also has to ascertain whether or not the vendor is the original developer of a piece of software. If the vendor is not the original developer, the chances are higher that less support will be provided.[3] As a final caution in this area, it should be noted that not all vendors support the software they sell.

3. Poor Documentation: Good documentation is essential, but not all purchased software is well documented. This must be examined very carefully by the potential buyer.

4. "Fly-by-Night" Vendors: In any growth industry such as the computer software field, there will be some marginal firms. A purchaser must be certain that the vendor being dealt with will be around after the software is purchased.

As can be seen, there are several advantages to purchasing software. A company must "buy smart," however, if it is to benefit from these advantages. In order to prevent "buying a lemon," the buyer must skillfully evaluate the software. Evaluation of purchased software is discussed in the remainder of this article.

Initial Evaluation Steps

Define Software Needs/Problems

Before any software is evaluated, the company must thoroughly analyze its present situation/problem to define its software needs. "The selection of software cannot be carried out independently of the business environment in which it will operate."[4] Although "needs analysis" (systems analysis) is beyond the scope of this article, the importance of this initial step cannot be overemphasized. If the buyer is unaware of the company's needs, then the evaluation of software is doomed to failure (or at most, minimal success). One author estimates that 40 percent of software purchase failures can be traced to buyers with poorly defined needs.[5]

Create a "Package Review Team"[6]

Assuming the buyer is certain that a software package should be purchased, a package review team should be formed. Each member of this group must be knowledgeable about the software needs of the company. The review team is responsible for constructing the "Application Requirements Document—ARD."[7] This document (which probably has several names) must contain all of the requirements and standards that the software packages will be judged against.

Locate Software Packages

Locating suitable packages is a difficult, lengthy task. Oftentimes, a company is unaware that a package is available that will satisfy the company's software needs. However, given the number of software houses that currently exist, chances are good that a suitable package does exist, even though the company might need to search several sources to find a particular software package. Unfortunately, there is not a single, comprehensive source that lists all software packages. Listed below are several sources that could be helpful in locating packages.

1. Computer manufacturers.
2. Software Houses:
   a. Companies that manufacture and offer their own software for sale.
   b. Brokers (middlemen) who sell software developed by others.
   c. Service bureaus that sell software for use on their own machines.

   A buyer can request literature and documentation from all three of these software vendors.[8]
3. Software Catalogs: Auerbach Software Reports, DECUS Program Library Catalog.
4. Other Users: This is an excellent source.
5. Other Sources: Computer magazines, consultants, junk mail, advertisements.

Screen Packages

While the evaluation team is reviewing information on the various software packages, it will become obvious that some packages are inadequate. By referring to the ARD developed earlier, the review team can identify and eliminate grossly inadequate software.

Send Out Requests for Proposals (RFPs)

Once the list of software packages is narrowed, RFPs can be sent to the vendors of the remaining packages. Why wait until this point in time to send out the Requests for Proposals? One justification is that it will save time and money. Sending the RFPs out after the initial screening eliminates meaningless demonstrations and presentations.

The RFP should list all of the user's needs, requirements, and constraints for the software.[9] After the replies are received, the buyer can further evaluate both the vendor and the vendor's software package. Software

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[3]Suzan Wooldridge, *Software Selection* (Philadelphia: Auerbach Publishers, Inc., 1973), p. 38.

[4]Ibid., p. 40.

[5]Warren N. Sargent, "Evaluating Software Is an Art," *Infosystems*, April 1976, p. 62.

[6]*Auerbach Information Management Systems, DP Administration, Part 2* (Pennsauken, N.J.: Auerbach Publishers, Inc., 1978), 2-07-04.

[7]Golland, p. 65.

[8]Wooldridge, p. 58.

[9]It is beyond the scope of this article to elaborate on the content of the RFP; however, several references in the footnotes do contain discussions of the development of content of RFPs.

demonstrations, visits to other users of the packages, and vendor presentations will enhance the evaluation.

What Should Be Evaluated?

Now that the buyer has located the *packages* to be evaluated, what *factors* should be considered? We have split the factors into two categories: general factors and technical factors.

General Factors

1. Supplier: There are two major concerns in this area. First, is the supplier an independent software vendor or a mainframe vendor?[10] Second, what is the history of the firm, what is its reputation, and how viable is the firm? The opinion seems to be that the quality of the software produced by mainframe vendors is not as high as the quality of the software produced by vendors who produce only software. This opinion is supported by research performed by the Datapro Research Corporation.

> Datapro Research Corp. conducted its annual survey of user reactions to software packages. . . . [There were] reports on 250 software packages, 102 from hardware vendors. This 40% representation from hardware vendors corresponds to an eight percent showing in Datapro's "Honor Roll" of superior products.[11]

The vendor's history, financial soundness, and reputation should also be evaluated. Wooldridge, in her book *Software Selection,* offers an excellent checklist for these considerations. Her list is partially reproduced below:

- *Reputation and Business Integrity—Business areas, age of company, clients
- *Size of the Company
- *Financial Soundness—profitability
- *Expertise—background of managers, technical ability of systems and programming staff[12]

2. Package History: How old is the package? Does the supplier have sole marketing rights? What is the price-change history of the package? Evaluation of these factors can lead to several interesting (though not always reliable) insights:

a. Age of Package: New software packages have yet to be proven through use. (Has the package been used elsewhere? If so, what are the users' reactions to the package?) On the other hand, older packages are sometimes viewed as being "better." This is not necessarily so.
b. Marketing Rights: Does the vendor have sole marketing rights to the package? If not, perhaps a better deal on the same package can be found.
c. Price-Change History: "It is rare for a price to be lowered, but if it is, this usually means that the package has been very successful."[13]

3. Documentation: As previously stated, the documentation for purchased software is usually quite good. Nonetheless, the documentation should be evaluated for completeness, quality, and ease of use.

4. Training: Several items must be considered in this area:

- *Who will be trained?
- *How much training is necessary?
- *Who will train?
- *Is there any follow-up training?
- *How much of the training is included in the package cost?[14]

5. Cost: A major item in the evaluation of purchased software is cost. The "initial and yearly costs" of the software must be determined. However, cost should not be the sole determinant in package evaluation and selection, since cost is not always a valid indicator of quality.

The cost consists of two parts: direct costs and indirect costs. The direct costs should be fairly visible; the indirect costs of the software (training, installation and conversion, maintenance, etc.) are much more difficult to determine. Nonetheless, all of the factors dealing with the indirect costs, as well as the direct costs, should be documented in the contract terms.

6. Contract Terms: Evaluating contract terms can be quite difficult. Keet suggests the following points to keep in mind before signing any contract agreement:

a. Don't buy a software product that isn't warranted against program defects, at least for one year.
b. Don't sign a contract without clearly establishing maintenance terms and costs. . . .
c. Don't sign a contract without incorporating the vendor's literature. . . . If verbal claims were made which aren't evidenced in the literature, make sure they are reduced to writing.
d. Don't commit to a software product without reducing installation responsibilities and acceptance procedures to writing.[15]

7. Other General Factors: Several other factors, such as ease of installation, understanding, and the existence of unnecessary options (package features that really are not needed), should also be evaluated.

Technical Factors

1. Package Features: The evaluation of package features is very important, as the features of each software package must be compared to the criteria specified in the ARD. The basic question in this phase is "Which package comes closest to doing what you want done in the way you want it done?"[16] Included as package features are six areas:

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[10]Keet, p. 60.

[11]Ibid

[12]Wooldridge, p. 81.

[13]Ibid., pp. 84-85

[14]Ibid., p. 98.

[15]Keet, p. 62.

[16]Wooldridge, p. 87.

file creation features, reporting features, input features, retrieval features, updating features, and processing features.[17]

2. Will Purchase of the Software Necessitate a Hardware Change? Some software packages are extremely hardware-sensitive, while others are quite flexible. A new software package might necessitate additional hardware, such as input preparation equipment. In addition, some software runs much more efficiently in different systems: "For instance, a package that is capable of running in 32k bytes of memory may be designed to run more efficiently if the computer has 64k bytes."[18]

3. Software Characteristics and Needs: There are two primary considerations in this area. First, what language is the software written in? Second, what are the software package's operating system requirements?[19]

Is the software written in a language that the present system can accommodate? If the software is written in PL1, for example, will it run on the present system or will a new compiler be needed? Also, is the data processing staff proficient in the language that the software is written in?

What are the package's operating system requirements? "Some software may need a special interface with the operating system."[20] Certainly, these factors will need to be weighed.

4. Modularity and Adaptability: Is the software able to adapt to changes in hardware and/or changes in the operating system? "A package with a high degree of modularity will have the ability to operate in multiple machine configurations."[21] Given the fact that computer systems are constantly changing, it is desirable to select software that can change with the system.

5. Processing Efficiency: "What is the processing efficiency of the package, i.e., how much computer resources (run time, primary storage and secondary storage) does the package require?"[22]

[17]The reader is referred to Suzan Wooldridge's book for a detailed discussion of questions one might ask in evaluating the particular features of a software package.

[18]Jan Snyders, "How to Buy Packages," *Computer Decisions*, June 1979, p. 51.

[19]James O. Hicks and Wayne E. Leininger, *Accounting Information Systems* (New York: West Publishing Co., 1981), p. 266.

[20]Wooldridge, p. 87.

[21]Snyders, p. 57.

Other Considerations

Tradeoffs

Certainly, several factors can be used when evaluating and comparing software. It is doubtful that one package will excel in all criteria. Therefore, it is necessary to evaluate the tradeoffs between packages. Depending upon how management "ranks" the criteria, certain packages will be more desirable than others. In other words, if the buyer is deeply concerned about cost, then the cost factor may outweigh other factors (vendor support, modularity) and cause certain packages to be more desirable than others.

Comparability Charts

To assist in the evaluation of software packages, it is helpful to construct comparability charts.[23] A comparability chart is simply a matrix listing all the packages to be evaluated and all the factors of evaluation. In addition, the chart may have built-in weighting devices, such as point scales, to facilitate comparison.

Not All Software Is Evaluated in the Same Manner

This report has dealt specifically with the evaluation of application programs. Although many of the aforementioned comments are equally applicable to other types of software (operating systems, utility program), it is realized that differences do exist in the evaluation of each type of software.

Conclusion

There are several advantages to purchasing software instead of developing it in-house. To benefit from buying software, the purchaser must carefully evaluate the available software packages. Although the overview that has been presented in this article will not guarantee that the best package is chosen, the reader should be able to use this presentation as a guide to ensure that no major evaluation procedure is overlooked.

[22]Hicks and Leininger, p. 266.

[23]Comparability charts are referred to as "Vendor Evaluation Checklists" by Keet, and as "Feature Comparison Checklists" by Wooldridge.

DEVELOPING A SYSTEM FOR REPORTING TURNOVER: A FOCUS ON IMPLEMENTATION ISSUES

*Timothy T. Serey and William L. Holloway**

Establishing a turnover reporting system is inextricably bound to the subtleties of organizational change and implementation. This article reports the results of implementing a turnover reporting system within a national retailing organization. Step-by-step procedures are described as well as the practical realities that enhance successful implementation in many organizations. A broad range of implications are discussed, including human resource planning, organizational diagnosis and change, and mechanisms for reducing the divergent goals of researcher-consultants and management practitioners.

Employee turnover can be one of the most pervasive and vexing problems that managers must face. The inability to retain talented people represents an enormous drain on the organization's human resources. Likert, for example, has noted that the cost of turnover can be from three to five times salary rates.[1] Although this estimate is crude and depends upon several variables, it is clear that loss of valuable people represents a "hidden cost." On a national scale it is also clear that the turnover problem is growing in size.[2] Quit rates among firms sampled increased from 1.4 percent in 1975 to 2.1 percent in 1979.

Unfortunately, neither these very general data, nor much of the data generated by behavioral science research, has helped human resource and line managers reduce turnover to acceptable proportions. In general, understanding of turnover leaves much to be desired. It is generally assumed, for example, that job satisfaction is causally related to turnover. However, Locke concluded that the job satisfaction-turnover relationship was tenuous at best.[3] The Porter and Steers review of the turnover literature called for a greater understanding of the psychology of the withdrawal process.[4] Mobley's approach developed a model that identified the possible precursors of turnover.[5] An advantage of his work and several other approaches has been the inclusion of perceived job alternatives (i.e., other types of employment options a person believes are available) in turnover research.[6]

Although far from exhaustive, these examples from turnover literature illustrate two significant weaknesses:

1. In general, these studies have been extremely organization-specific. Practicing managers are often left to making inferences about the extent to which turnover findings apply to their organization.
2. The studies have had poor explanatory power for telling managers *how* to attack a turnover problem or *where* to begin.

Therefore, the purpose of this article is to describe the "where" and "how" to begin to resolve a turnover problem. The discussion is based on two assumptions:

1. Some organizations do not truly know the status of turnover. Many others have nothing beyond the crudest of turnover ratios to guide management's decision making. Therefore, the "where to begin" is to establish a technique that identifies a set of crucial information about the turnovers.
2. The "how to begin" must not only include the data collection process but also deal with issues of implementation. The procedure described below will emphasize the step-by-step process of how to develop the turnover reporting system. This emphasis will recognize practical realities and organizational politics facing many managers.

The focus is on implementation for several reasons. First, the general neglect of the pragmatic issues of implementation in consulting or organizational development activities is well documented.[7] For example, consultants often concentrate on selling the client a prepackaged or technique-bound service (such as "participatory management" or communication workshops) while neglecting to assess the needs of the organization and its

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[1] R. Likert, "Human Resources: The Hidden Assets of Your Firm," in D. R. Hampton, ed., *Behavioral Concepts in Management* (Encino, Calif.: Dickenson, 1972).

[2] U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings* 26, no. 3 (1979): 120.

[3] E. A. Locke, "The Nature and Causes of Job Satisfaction," in M. D. Dunnette, ed., *Handbook of Industrial and Organizational Psychology* (Chicago: Rand-McNally, 1976).

[4] L. W. Porter and R. M. Steers, "Organizational Work, and Personal Factors in Employee Turnover and Absenteeism," *Psychological Bulletin* 59 (1973): 603-609.

[5] W. H. Mobley, "Intermediate Linkages in the Relationship Between Job Satisfaction and Employee Turnover," *Journal of Applied Psychology* 62 (1977): 237-40.

[6] F. Dansereau, J. Cashman, and G. Graen, "Expectancy as a Moderator of the Relationship Between Job Attitudes and Turnover," *Journal of Applied Psychology* 59 (1974): 228-29; J. L. Price, *The Study of Turnover* (Ames, Iowa: State University Press, 1977); and J. Schneider, "The 'Greener Grass' Phenomenon: Differential Effects of a Work Context Alternative on Organizational Participation and Withdrawal Intentions," *Organizational Behavior and Human Performance* 16 (1976): 408-433.

[7] M. Beer, "The Technology of Organization Development," in Dunnette.

members. Given the abundant literature about resistance to change, less-than-enthusiastic implementation frequently results because people are unsure about how the consultant's recommendations will affect their interests. Moreover, this problem may be compounded when an organizational development (O.D.) effort is led by a person with an academic research orientation. Dubin pointedly notes that researchers and managers usually have differing and often conflicting goals.[8] The academician's goals frequently center upon testing a set of ordered relationships or refinement of theory in an empirically relevant manner. The practitioner, on the other hand, has a goal of knowing the present situation and either preserving or changing it in some preferred direction. This discontinuity in goals may place the researcher and the manager in the unenviable roles of working at cross purposes to one another. The researcher focuses on building theory while the manager concentrates on normative issues concerning if or to what extent the system should change. Neither party is able to build the commitment required for successful change.

The premise of this article is that the potential divergence between consultants (or researchers) and practicing managers can be resolved by focusing upon implementation issues. These issues directly relate to a variety of roles: consultant, researcher, personnel or human resource manager, line manager, and employee. Substantively, to demonstrate the relationship between implementation issues and organizational change, the consulting project described below focuses upon a problem endemic to many complex organizations: employee turnover.

The technique that is described was developed in a large national retailing organization. The company consists of several relatively autonomous department stores in major cities across the nation. Typically, a store includes a downtown location and several shopping center branches. In many stores, turnover statistics were compiled from personnel files for exempt personnel for each job title (buyer, assistant buyer, etc.). For the most part turnover was limited to descriptive statistics and other limited computation of turnover ratios (e.g., number departed/number assigned). Consequently, it was not possible to determine the reasons people were leaving or the quality of exiting employees. Management's ability to take corrective action either at the store level or at corporate headquarters was constrained by the extremely poor information it was receiving.

Phase I: Conceptual Issues of Organizational Diagnosis

From the beginning the turnover reporting system was treated as a program of organizational change rather than "just a report." Viewing the turnover reporting system as a process of organizational change focuses upon several implementation issues. This in turn leads to the necessity of addressing the subtleties of winning the support and cooperation of the store managers. Visits were made to most of the major stores to elicit their input. Typically, the vice president of personnel or human resources and his or her staff (e.g., personnel manager, training and development manager) were interviewed to assess several factors, such as: What kind of information would they like to see the new report reflect? What turnover problems were they experiencing? What type of analysis would be most helpful? In several cases, the chief executive officer and the line managers also were interviewed.

Because of the relatively autonomous nature of the store locations, considerable care was taken to build a relationship of trust with principal store managers. For example, one common problem that often plagues internal or external consultants is employee fear that the person is a "corporate spy." Particularly with respect to decentralized sites, complete confidentiality *must* be kept. Before managers and employees open up about the "real" causes and facets of turnover, they must have reasonable confidence that the information will not become a pipeline to corporate headquarters. This suggests the need to have a commitment from top headquarter's management that the consultant will have "cover" if such disclosure pressure is ever applied.

There are several goals during this organizational diagnosis phase. First, it is crucial to assess the status of the turnover problem from the perspective of the individual operating locations. Often a very different picture emerges when contrasted with the corporate office view. Second, store visits are designed to begin building relationships of trust with individual managers. During this process one can expect a certain amount of "testing" by both parties (i.e., corporate consultant and site managers) not unlike a "courting" ritual. In other words, during the initial stages of organizational change, it is likely that both consultant and site location managers will attempt to solidify the boundaries of the consultant's role. Regarding confidentiality, local managers must accept the consultant's ethical and professional behaviors as inviolate. Finally, eliciting input from the stores facilitates a sense of ownership of the new reporting system by store personnel. The success of the turnover reporting system depends upon the commitment of the people in the operating locations.

Phase II: Assessment of What Data to Include and How to Collect It

Determination of what information to include in the reporting system posed a major problem. This problem is a prime example of the divergent goals of the consultant-researcher and the needs of the organization. On one hand, management was committed to a data-based approach to organizational change. This commitment was constrained by such practical realities as costs and time required to collect the data. On the other hand, the consultants, who held academic posts, had postulated a model of employee turnover and wanted to collect data conducive to testing that model. The guiding principle for resolving the dilemma was this: What is the *minimum* set

[8] R. Dubin, "Theory Building in Applied Areas," in Dunnette.

of needed information to provide *quality* data about turnover? As the number of items collected increases, so does the likelihood of a richer, more in-depth view of the turnover problem. However, increasing the number of items collected can also stiffen the resistance of store personnel because of the additional time and resources required.

Another tradeoff concerns the procedure for collecting turnover information. The exit interview provides the most efficient means of acquiring quality data. However, several major problems exist with this technique. The potential response bias during exit interviews is well known. Interviewees may have had a past relationship, either positive or negative, with the interviewer. Exiting persons may also suspect that telling the "real" story may adversely affect future job references. Furthermore, to minimize the reactive aspects of the interview, interviewers must be carefully trained in interviewing techniques, such as establishing rapport, probing, etc.[9] Because of the scope of the problem and the overall size of the organization, it was decided to initially limit the exit interviews and the reporting system to exempt turnovers. In spite of the potential pitfalls of exit interviews, this process was clearly superior to use of crude descriptive data from personnel files, anonymous questionnaires given to exiting persons, or other procedures. The potential for collecting higher quality data through interviewer training was the foremost reason for using exit interviews.

The exit interview form was divided into two sections: demographic and personal information and the interview section itself. The former area included such items as the person's exact store location (e.g., downtown, which branch), job title, age, sex, annual salary, and ranking of performance taken from the last regularly scheduled appraisal. Personnel clerks can typically transcribe this data directly from the individual's personnel file. Using the last scheduled performance appraisal on file is desirable because of the potential rating errors associated with appraising a person after she or he has decided to leave the organization. Management must be able to accurately determine the quality of people (e.g., below average, average, above average) leaving the company.

The second section of the exit interview form concerned the interview process itself. Although a detailed description of the items covered is beyond the scope of this article, they included such things as where exiting employees were going and a wide array of questions that probed the issue of *why* people were leaving. Of course, determination of the "real" reasons people leave lies at the center of the interview's validity. A special effort was made to eliminate confounded questions and reasons for leaving that were useless categories because they could not be interpreted (e.g., "personal" reasons).

[9]E. J. Webb, D. T. Campbell, R. D. Schwartz, and L. Sechrest, *Unobstrusive Measures: Nonreactive Research in the Social Sciences* (Chicago: Rand-McNally, 1966).

For purposes of illustration, five questions from the exit interview form are depicted in Figure 1. Responses to these questions would be recorded by a carefully trained exit interviewer. This training process is described in the following section.

Figure 1

EXCERPTED ITEMS FROM EXIT INTERVIEW FORM
(Completed by a Trained Exit Interviewer)

1. To what extent did the lack of job challenge affect your decision to leave?

Affected Quite A Lot	Somewhat Affected	Affected An Average Amount	Slightly Affected	Not Affected At All
5	4	3	2	1

2. Describe the effectiveness of your relationship with your supervisor.

Quite Effective	Somewhat Effective	"So-So" Or Average	Somewhat Ineffective	Quite Ineffective
5	4	3	2	1

3. To what extent was your job here (at the time of leaving) related to your career goals?

Quite Related	Somewhat Related	Neither Related Nor Unrelated	Somewhat Unrelated	Quite Unrelated
5	4	3	2	1

4. Describe your feelings toward the job:
   I hate it. 1
   I dislike it. 2
   I don't like it. 3
   I am indifferent to it. 4
   I like it. 5
   I am enthusiastic about it. 6
   I love it. 7

5. Circle ONE of the following to show how the person thinks he or she compares with other people.
   No one likes his job better than I like mine. 1
   I like my job much better than most people like theirs. 2
   I like my job better than most people like theirs. 3
   I like my job about as well as most people like theirs. 4
   I dislike my job more than most people dislike theirs. 5
   I dislike my job much more than most people dislike theirs. 6
   No one dislikes his job more than I dislike mine.. 7

Note: Items 4 and 5 are taken from the instrument developed by R. Hoppock to assess job satisfaction.

Phase III: Implementation

Before the reporting system could become operational, several implementation issues had to be addressed. The single most important of these issues was the necessity to solidify the commitment of individuals at the store locations. The initial store visits in the various cities were not sufficient to induce real support. Understandably, store personnel had many concerns centering around the "how to" aspects of the process. Because corporate headquarters considered implementation so crucial, it was committed to "fine tuning" the exit interview process and accepting changes that the stores wanted to include.

To accomplish this, a relatively elaborate program was required to train store personnel in exit interviewing procedures. Generally, each site should have a minimum of three exit interviewers: primary, secondary, and an executive-level interviewer. Usually this means that someone, such as an assistant personnel manager or manager of training and development, assumes primary interviewing responsibility. An alternative person with similar

MID-SOUTH ECONOMY

BUREAU OF BUSINESS & ECONOMIC RESEARCH THE FOGELMAN COLLEGE OF BUSINESS AND ECONOMICS MEMPHIS STATE UNIVERSITY

STATISTICAL SUPPLEMENT

THE MID-SOUTH ECONOMY

In the second quarter the Mid-South economy generally did not perform as well as the national economy. This is especially true if the strong performance of Louisiana is excepted. Growth in personal income in the Mid-South from January 1980 to January 1981 was 1.9 percent below the national rate of 10.4 percent. However, the Mid-South economy has shown some overall improvement in its performance since the beginning of the year, based on the latest months for which data are available.

Civilian Labor Force

The nation's civilian labor force grew by 273,000 in April 1981 and increased by 2.2 percent from a year earlier for a total of 105,678,000. In Louisiana the civilian labor force continued to grow at a rate faster than the nation's, increasing by 76,900 or 4.6 percent since a year ago. The rates in the other Mid-South states showed little change from last year's figures.

The number of persons unemployed in the United States decreased by 691,000 over the month to an unadjusted 7.0 percent of the labor force. The Alabama unemployment rate was the highest in the Mid-South in April, at 8.4 percent. From a year earlier, Arkansas was the only Mid-South state where the number of unemployed grew less than the national rate of 8.0 percent.

Non-Agricultural Employment

Non-agricultural employment in the United States totaled 91,365,000 in April, increasing only 0.7 percent over April 1980. Employment gains in Louisiana continued to outpace the nation and the Mid-South, increasing by 4.3 percent or 66,700 workers from a year earlier. Over the same period, Alabama and Tennessee registered declines of 1.7 percent and 1.8 percent, respectively.

Declines from a year ago continue through this year in manufacturing employment for the United States and four of the Mid-South states. Louisiana, the only state to show gains, added 5,000 manufacturing jobs, primarily in the transportation equipment and petroleum sectors. Alabama lost 15,100 production workers from last April's mark, or 4.1 percent, concentrated mainly in metals and transportation equipment.

Non-manufacturing employment was up 1.0 percent from April 1980 in the United States, totaling a seasonally adjusted 71,039,000. Again, Louisiana led the way, adding 61,700 more jobs since April 1980. In Tennessee, the non-manufacturing work force declined 2.5 percent from a year earlier.

Earnings

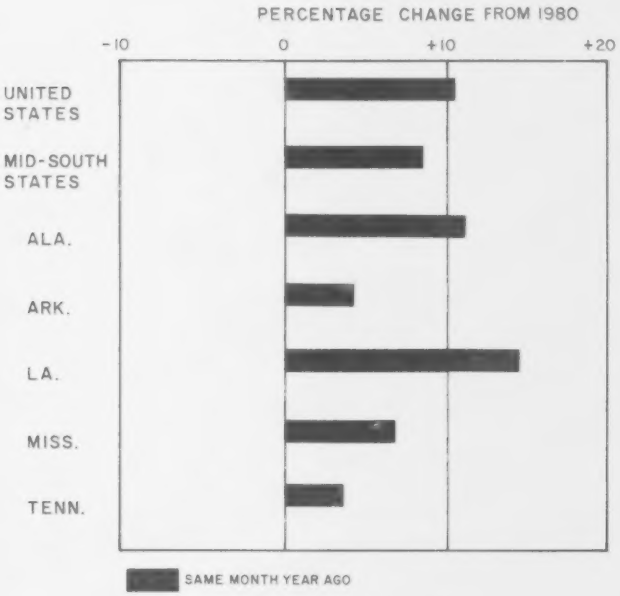
Average weekly earnings for production workers in manufacturing in the United States totaled $312.04 in April, an increase of 11.7 percent from a year ago. Over the same period, Arkansas and Mississippi were the only Mid-South states to outperform the national increase, up slightly more than 13.0 percent. Louisiana production workers remained, on average, the highest paid, at $337.28 per week, but failed to keep pace with the other Mid-South states and the nation, registering an increase of only 7.2 percent. This was primarily due to a 1.7 percent drop from last April in average hours worked. Mississippi led the Mid-South with a 9.1 percent increase in hourly earnings over the year and was the only state to outpace the national rate of 10.9 percent.

Construction

The value of total construction contracts awarded in four Mid-South states—Arkansas, Louisiana, Mississippi, and Tennessee—totaled $758.4 million for the month of May, up 32.6 percent from a year ago. Mississippi experienced the largest increase, spending about one and a half times more than in May 1980 and 69.1 percent more for the first five months of the year. Tennessee registered a 5.9 percent drop from last May but was still 21.4 percent ahead of the year-to-date spending level.

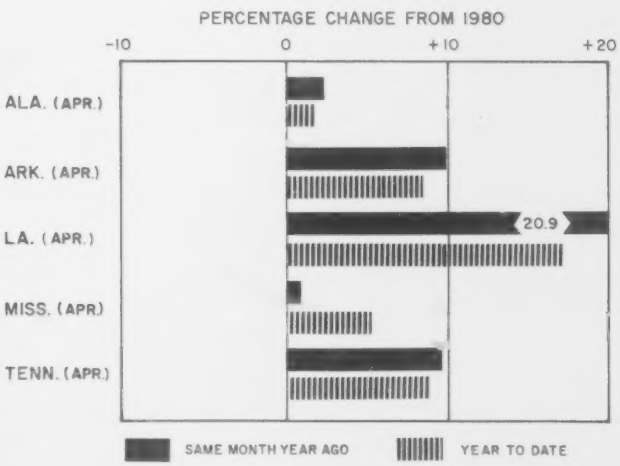
Residential construction awards in May increased 28.1 percent from a year earlier in Region 6. Louisiana turned in the best performance, spending 91.2 percent more than last May and building 2,512 more dwelling units in the first five months of the year, 28.4 percent ahead of last year. Tennessee was the only state to register a decline in dwelling unit starts, having 4.2 percent fewer units under

PERSONAL INCOME - JAN., 1981

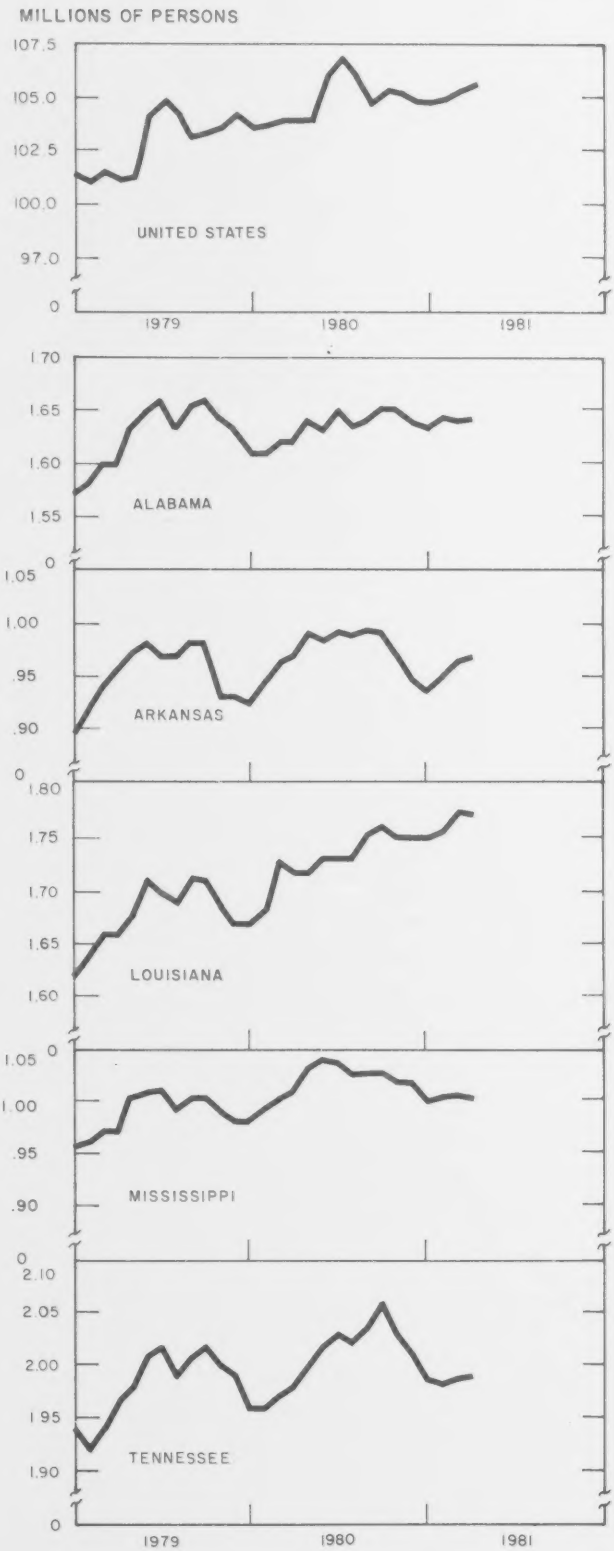


SOURCE BUSINESS WEEK, MAY 11, 1981

SALES TAX COLLECTIONS 1981



CIVILIAN LABOR FORCE



LABOR April 1981	United States	Mid-South States				
		Alabama	Arkansas	Louisiana	Mississippi	Tennessee
Civilian Labor Force	105,678,000	1,640,400	970,800	1,768,600	1,017,600	1,987,200
Percent Change Year Ago	+ 2.2	+ 0.8	+ 0.3	+ 4.6	- 0.1	- 1.1
Unemployed	7,396,000	137,700	73,300	124,000	76,900	148,000
Percent Change Year Ago	+ 8.0	+10.9	+ 4.7	+17.2	+14.6	+15.4
Unemployment Rate						
1981	7.0	8.4	7.6	7.0	7.6	7.4
1980	6.6	7.6	7.2	6.3	6.6	6.4
Non-Agricultural Wage & Salary Employees	91,365,000	1,343,000	751,300	1,620,900	831,200	1,720,000
Percent Change Year Ago	+ 0.7	- 1.7	+ 0.5	+ 4.3	- 0.8	- 1.8
Manufacturing Employment	20,455,000*	355,600	211,500	214,700	219,100	511,300
Percent Change Year Ago	- 0.9	- 4.1	- 0.5	+ 2.5	- 3.0	- 0.2
Non-Manufacturing Employment	71,039,000*	987,400	539,800	1,406,200	612,100	1,208,700
Percent Change Year Ago	+ 1.0	- 0.9	+ 0.9	+ 4.6	0.0	- 2.5
Average Weekly Earnings of Production Workers in Manufacturing	$312.04	$280.40	$243.94	$337.28	$235.61	$261.36
Percent Change Year Ago	+11.7	+10.8	+13.1	+ 7.2	+13.3	+11.6
Average Weekly Hours of Production Workers in Manufacturing	39.7	40.0	39.6	40.2	39.4	39.6
Percent Change Year Ago	+ 0.8	+ 1.0	+ 2.9	- 1.7	+ 1.6	+ 0.8
Average Hourly Earnings of Production Workers in Manufacturing	$7.86	$7.01	$6.16	$8.39	$5.98	$6.60
Percent Change Year Ago	+10.9	+ 9.7	+10.0	+ 9.1	+11.6	+10.7

*Seasonally adjusted.

Source: Departments of Employment Security and Survey of Current Business.

CONSTRUCTION 1981	United States (April)	Mid-South Region 6* (May)	Alabama (May)	Arkansas (May)	Louisiana (May)	Mississippi (May)	Tennessee (May)	West Tennessee (May)
Value of Construction Contracts Awarded								
Total Construction								
Percent Change Year Ago	+10.4	+59.1	NA	+11.4	+41.9	+147.9	- 5.9	+35.9
Percent Change Year-to-Date	+ 7.2	+27.4		+28.7	+25.4	+ 69.1	+21.4	+12.4
Total Building								
Percent Change Year Ago	+12.4	+59.0	NA	+19.0	+61.6	+ 31.5	+12.2	+47.9
Percent Change Year-to-Date	+ 6.7	+32.9		+23.4	+23.1	+ 22.6	+27.5	+18.3
Residential Building								
Percent Change Year Ago	+16.8	+28.1	NA	+18.9	+91.2	+ 8.9	+11.5	+29.7
Percent Change Year-to-Date	+ 7.6	+30.0		+24.1	+49.1	+ 25.6	+12.3	+10.8
Non-Residential Building								
Percent Change Year Ago	+ 8.3	+95.5	NA	+19.5	+32.6	+121.0	+13.2	+71.0
Percent Change Year-to-Date	+ 5.9	+36.0		+22.1	+ 3.9	+ 15.6	+47.7	+27.3
Public Works and Utilities								
Percent Change Year Ago	- 0.5	+59.8	NA	+ 2.8	+ 0.2	+772.9	-47.4	-20.0
Percent Change Year-to-Date	- 1.1	+13.6		+45.4	+33.2	+209.3	+ 5.0	- 9.0
Total Dwelling Unit								
Starts to Date	550,700	32,702	NA	5,993	11,354	5,986	9,402	2,477
Percent Change Year Ago	+14.5	+17.5		+10.5	+28.4	+ 19.6	- 4.2	+ 7.1

*Region 6 includes Arkansas, South Illinois, Louisiana, Mississippi, East Missouri, and West Tennessee.

Source: F. W. Dodge Reports and Federal Reserve Bulletin.

construction since January than for the same period in 1980.

The value of contracts for non-residential construction almost doubled in May for the Region 6 area, up 95.5 percent from a year earlier. Mississippi was the only state to outpace the Region 6 increase, climbing from $11.9 million in May 1980 to $26.3 million in May 1981 for a 121.0 percent increase.

Public works construction was a mixed bag for the Mid-South in May. Mississippi registered a substantial increase from the relatively low level of a year ago. Arkansas and Louisiana had marginal increases over last May but far outpaced the Region 6 year-to-date increase of 13.6 percent. Tennessee dropped 47.4 percent from the spending level of last May but remained 5.0 percent ahead for the first five months of the year compared to 1980.

Finance

Banking activity data indicate that the Mid-South outperformed the national growth rates in total deposits

and time deposits for the year to date. The continuing decreases in net demand deposits created in the Mid-South were about twice the national rate of 5.5 percent. Mississippi, the only state to exceed the national increase of 7.1 percent, registered a 9.9 percent increase over last April in total loans made.

Figures from the various Federal Home Loan Banks show that mortgage loans made in April 1981 were well above the lending activity of last April, except for Arkansas, which had a drop of 13.9 percent. Alabama experienced the largest gain, from $20.4 million in April 1980 to $38.7 million in April 1981. Net savings flow activity continues to contract throughout the Mid-South, with substantial declines across the board.

FINANCE 1981	United States[1]	Mid-South States District 8 Only[2]	Alabama District 6	Arkansas District 8	Louisiana District 6 Only	Mississippi District 8 Only	Tennessee District 8 Only
Member Banks as of 4/29/81 Percent Change from Comparable Date 1980							
Total Loans	+ 7.1	+ 4.2	NA	+ 4.1	NA	+ 9.9	+ 2.0
Total Deposits	+ 8.7	+ 9.1		+ 9.6		+12.2	+10.5
Net Demand Deposits	- 5.5	-11.5		-11.2		-10.1	-15.5
Time Deposits	+16.0	+17.0		+18.9		+20.3	+18.3

[1]United States data are for all domestically chartered commercial banks except for branches of foreign banks.

[2]Mid-South data are available only for District 8, which includes all of Arkansas, North Mississippi, and West Tennessee.

Source: Federal Reserve Board of Governors and the Federal Reserve Bank of St. Louis.

SAVINGS AND LOAN ACTIVITY April 1981	Alabama	Arkansas	Louisiana	Mississippi	Tennessee[1]
Mortgage Loans Made (millions)	$ 38.7	$ 33.5	$ 82.7	$ 25.1	$ 38.1
Percent Change Year Ago	+ 89.7	- 13.9	+ 24.9	+ 23.0	+ 56.0
Percent Change Year-to-Date	+ 29.6	- 23.9	+ 16.2	+ 8.6	+ 3.5
Net Savings Flow (millions)[2]	($ 23.1)	($ 23.9)	($ 22.3)	($ 17.3)	($ 19.8)
Percent Change Year Ago	-290.9	-655.8	-173.0	-260.2	-236.9
Percent Change Year-to-Date	- 31.2	- 99.5	- 35.0	- 65.2	- 37.4

[1]Figures are for total loans made.

[2]Net savings flow equals new savings received plus dividends credited minus savings withdrawn.

Source: Federal Home Loan Banks of Little Rock, Cincinnati, and Atlanta.

THE TENNESSEE ECONOMY

The Tennessee economy added 2,000 members to its civilian labor force in April, for a total of 1,987,200, but registered a 1.1 percent decline from last April. The unemployment rate showed a month-to-month decrease, from 8.4 percent in March 1981 to 7.4 percent in April. But the number of persons unemployed in April, 148,000, was a 15.4 percent jump from a year earlier.

Non-agricultural wage and salary employment totaled 1,720,000 in April, down 1.8 percent from a year ago. Manufacturing employment showed a March to April increase of 4,300 jobs and was only slightly down from last April. However, non-manufacturing employment, although increasing by 2,300 jobs since March, declined 2.5 percent from last April to total 1,208,700.

Tennessee's growth in personal income from January 1980 to January 1981 was the lowest in the Mid-South, increasing by only 3.5 percent—less than half the Mid-South increase of 8.4 percent. Weekly earnings for manufacturing production workers averaged $261.36 in April, up 11.6 percent from last April and nearly matching the national increase of 11.7 percent. Average hourly pay for Tennessee production workers in manufacturing was $6.60.

The value of total construction contracts awarded in Tennessee was $207.5 million in May 1981, down 5.9 percent from May 1980. For the first five months of 1981, however, total construction spending was 21.4 percent ahead of last year, reaching a total of $1.156 billion. Residential construction was up 11.5 percent over last May, but total dwelling units started since January declined 4.2 percent compared to the same period in 1980. Non-residential building totaled $440.5 million for the first five months of 1981, up 47.7 percent for the year to date. Tennessee was the only Mid-South state to exceed the Region 6 increase of 36.0 percent. Public works construction dipped 47.4 percent from last May but remained slightly ahead, by 5.0 percent, of the comparable year-to-date spending total.

Revenues from sales tax collections totaled $88.4 million in April, up 9.6 percent from a year earlier. Total bank deposits and time deposits grew faster in Tennessee than in the nation, while net demand deposits fell three times faster than those for the nation as a whole.

functional affiliation (e.g., personnel or organizational development) is also required. A third person who holds a higher position (e.g., vice president of personnel or personnel director) should also be trained to do exit interviews with upper managers and executives.

Two primary purposes of the training session should be met. First, it is necessary to standardize the measures across all sites. For example, should a leave of absence be counted as a turnover? Second, it is necessary to standardize interviewing procedure across all sites. Each exit interviewer must be interviewing in the same way and must be able to understand the meaning of each question, how to probe, etc.

To increase the effectiveness of the implementation phase, two additional steps should be considered. First, it is highly desirable to establish a pilot turnover system in two or three locations before system-wide implementation occurs. The pilot has the advantage of providing actual data about the practical aspects of interviewing, such as eliminating or rewording troublesome questions. Moreover, the pilot sites may increase the potential for successful implementation in a less obvious way. For example, a criterion for selection of pilot locations should be the status of the managers and the overall prestige of the site. These locations may then act as opinion leaders to informally persuade others to enthusiastically support the new reporting system. Second, it is also desirable to design an evaluation component into both the pilot program and the system-wide report. Managers should be able to assess the effectiveness of the program from both the corporate and field locations.

Phase IV: Analysis of Data and Formulation of Report

Another set of implementation issues is related to how the information should be compiled, analyzed, and fed back to the operating locations. Compilation of actual turnover data began in each store with an exit interview form for each exiting exempt person. These forms were then mailed to corporate headquarters. Coding of questionnaires (i.e., completed form) and key punching was done by clerical persons. Coordination with the data processing unit was also necessary to insure compatibility of programming, output format, etc.

Organizations contemplating using this process also must decide upon the types of analysis desired. In this case, it was decided that turnover reports would be fed back to operating locations biannually. However, system design provided the capability for a quicker turnaround time. For example, if one store division was experiencing unusually high turnover, monthly reports could be fed back to management for more timely action. Two types of analysis were designed. First, a presentation of descriptive statistical data gave store management an accurate depiction of turnover. This information might include data presentation by job title, store location (e.g., downtown versus branch number 2), department (linens, furniture, ready to wear, etc.). The system also was designed to provide the capability for custom-made reports to highlight areas of special interest to any specific operating store. Site locations would participate in this program in proportion to perceived utility to them. Therefore, organizations that implement this process should retain flexibility to decide which data will provide useful information to managers for decision making.

A strong caveat is in order here. Managers should be sensitive to the potential for using the report as a kind of organizational report card. Without question, any time the organization collects data such as turnover and its causes, reports may have an evaluative overtone. However, managers should resist the temptation to react with punitive measures. The purpose of this reporting system should be identification of turnover problems, their causes, and what can be done to revitalize the organization, not punishment of individual managers.

A second analysis category was directed toward answering causal questions about turnover. These more powerful statistical analyses have the capability to address the question of *why* people leave the organization. Eventually, it may be possible for an organization to develop turnover trends and relate these patterns to hard measures of organizational performance. Ideally, an optimum level of turnover might be developed. This clearly suggests that managers should understand that perhaps turnover should not be reduced to zero. For example, organizational effectiveness can be increased by not retaining marginal performers.

Managers who attempt to develop this system for reporting turnover should be able to adapt the process to non-exempt employees as well as the professional workforce. The technique seems generalizable to a wide variety of organizations. It appears to be especially relevant wherever geographically separate operating units exist, such as retail chains, insurance branches, or regional offices of public sector organizations. As Townsend noted in his best seller, *Up the Organization*,[10] it is particularly difficult to manage geographically separated locations. Headquarter-level managers may find it especially difficult to grasp the "real" reasons people leave the organization when those people and the immediate hierarchy above them are thousands of miles away.

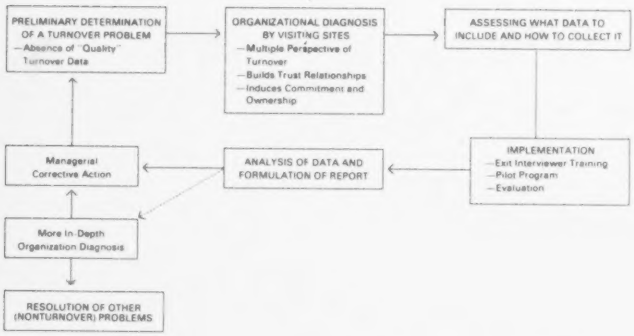
Summary

Figure 2 represents the phases of the turnover reporting system and its relationship to managerial decision making. By following the steps of the organizational diagnosis stage, assessment of what to include in the report, implementation, and analysis, managers should be able to determine the status of employee turnover with greater confidence. This step-by-step process has built-in ownership of the turnover reporting system and results in acceptance of the problem's severity by providing managers with quality data and increasing the utility of the report itself. By elucidating the turnover problem and its

[10]R. Townsend, *Up the Organization* (New York: Knopf, 1970).

causes, this reporting system will enable management to formulate higher quality decisions and take corrective action. Presumably, acceptance of managerial decisions about turnover should be increased.

Figure 2
THE TURNOVER REPORTING SYSTEM AND ITS RELATIONSHIP TO MANAGERIAL DECISION MAKING


PRELIMINARY DETERMINATION OF A TURNOVER PROBLEM
—Absence of "Quality" Turnover Data
ORGANIZATIONAL DIAGNOSIS BY VISITING SITES
—Multiple Perspective of Turnover
—Builds Trust Relationships
—Induces Commitment and Ownership
ASSESSING WHAT DATA TO INCLUDE AND HOW TO COLLECT IT
IMPLEMENTATION
—Exit Interviewer Training
—Pilot Program
—Evaluation
ANALYSIS OF DATA AND FORMULATION OF REPORT
Managerial Corrective Action
More In-Depth Organization Diagnosis
RESOLUTION OF OTHER (NONTURNOVER) PROBLEMS

This article has suggested that successful establishment of a turnover reporting system must address practical implementation issues. Clearly, we need to attend the plea of Porter and Steers: We do need a more complete understanding of the psychology of the withdrawal process. However, human resource managers also need to attend to the requirement of *quality* turnover data and inducement of people in the organization to provide this data for decision-making purposes. Until this occurs, managerial effectiveness may be seriously limited because of the inaccurate or incomplete understanding of the causal aspects of turnover.

This turnover reporting system also may serve managers as one of several barometers of overall organizational health. For example, managers may be reasonably satisfied if exiting employees tend to be low or marginal performers. Such a finding might even be a subtle indicator of organizational effectiveness. However, the reporting system also may provide an indication of potential problem areas. Ideally, managers should use the system as a precursor to more in-depth organizational diagnosis and organizational change (see Figure 2). In other words, managers need to know the causal turnover factors *before* people decide to leave the organization, thus eliminating some biases indigenous to the exit interview. Finding out why people stay in the organization as well as why people leave is also possible. Resolution of other (nonturnover) problems (e.g., career pathing, equitable salary administration) is another outcome of this procedure.

Although the system described here has not addressed the issue, it should be possible to determine the costs of exit interviews, data analysis, and the overall reporting system. Given the extraordinary costs of turnover, as mentioned earlier, and the drain on the organization's human resources, managers should be able to eventually assess the net turnover reduction. Although it remains an untested empirical question, managers may be able to justify implementing this system based upon cost-effective analysis. The recent procedure reported in detail by Mirvis and Lawler[11] for measuring costs of absenteeism and turnover seems to hold particular promise when used to assess the reporting procedure described in this article.

This turnover reporting process also has implications for reducing the divergence of goals between the researcher-consultant and the practitioner. Clearly, one resolution of this problem as it pertained to this consulting project centers upon the real world relevance of testing turnover theory. For example, had the consultants started in the real world of this specific organization, different components of turnover might have been built into the model. In a more general sense, this suggests the desirability of selecting empirical indicants that are valid for the researcher and politically acceptable to the client-manager. Nearly twenty-five years ago, Mann noted the importance of dealing with the client's acceptance and utilization of the data from the beginning of the consultant-client relationship.[12] Researchers and consultants would do well to note that time has not diminished the validity of Mann's advice.

Viewing divergent goals from a different perspective, the client should recognize the interdependencies between the theoretician-researcher-consultant and the manager. Even though it is true that the researcher must depend upon the real world to circumscribe the boundaries of a model, dependencies exist in the other direction also. Managers may operate a business successfully based upon an implicit model or set of assumptions. In this consulting project, there were, in fact, several department store divisions that were successfully managing turnover of salaried personnel. However, both in this specific case and in more general situations, managers may be forced to extrapolate from one situation (or store site) to another. To the extent that conditions change from one setting to the next, managers become increasingly vulnerable to atheoretically extending results.

Enter the researcher. In the project described in this article and in many other consulting relationships, the researcher can provide an invaluable service. By explicitly developing and testing theory, the researcher can describe *how* variables are related to one another. This richer view of the phenomenon of interest is eminently practical, since it often leads to a fuller understanding of cause-and-effect options for the manager. Ultimately, the most productive interplay between the researcher-consultant and the practitioner occurs whenever each party supports the goals of the other as well as his or her own.

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[11]P. H. Mirvis and E. E. Lawler, "Measuring the Financial Impact of Employee Attitudes," *Journal of Applied Psychology* 62 (1977): 1-8.

[12]F. C. Mann, "Studying and Creating Change: A Means to Understanding Social Organization," in *Research in Industrial Human Relations*, Industrial Relations Research Association Publication No. 17 (1957): 146-67.

FINANCIAL REPORTING FOR MUNICIPALITIES: A REVIEW OF RECENT CHANGES IN STANDARDS

*Nickolas G. Apostolou, Walter A. Robbins, and William Goodman**

The financial disclosure and reporting practices of American cities are currently being questioned by many groups in our society—the courts, the press, governmental regulatory agencies, bond raters, and other interested parties. Of primary concern is the adequacy of financial information used to make public policy decisions. The severe financial difficulties that began surfacing in several major U.S. cities during 1975 spurred a reevaluation of the reporting practices of cities and states. In 1976, Coopers & Lybrand and the University of Michigan undertook a joint study of the disclosure practices in 46 American cities.[1] Among their findings were the following:

1. Sixty-three percent of the cities did not disclose the accounting policies used to value pension obligations.
2. Sixty-one percent of the cities did not issue their annual reports within 90 days after the fiscal year-end.
3. Fifty percent of the cities did not disclose their overlapping debt.

At a recent meeting of the National Association of State Auditors, Comptrollers, and Treasurers, Brenton Harries, president of Standard & Poor's Corporation, said that the results of a recent poll of 200 market makers and institutions in the tax-exempt sector indicate that taxpayers are paying higher borrowing fees on bonds because of poor municipal accounting practices. He indicated that where financial reporting is substandard, a city selling $100 million of general obligation bonds with a 10-year average life will pay $1,250,000 to $2,500,000 in penalties over the life of the bonds. Harries concluded by stating that municipal financial statements that do not comply with generally accepted accounting principles (GAAP) could be "a negative factor in the bond rating process."

It is clear that city officials and financial officers must critically evaluate the extent to which their city's financial reporting complies with GAAP. To assist in this assessment, this article identifies the sources of accounting principles applicable to state and local governmental units, discusses the informational needs of those using municipal reports, and summarizes recent changes in governmental accounting standards. In addition, an analysis of how well eight Tennessee cities currently comply with selected accounting principles is presented, and interpretative and evaluative comments are offered.

Sources of Governmental Accounting Principles

Currently, accounting principles for state and local governmental units are derived from a number of sources:

1. The National Council on Governmental Accounting (NCGA) promulgates accounting principles via its series of statements. NCGA Statement 1, *Governmental Accounting and Financial Reporting Principles*, sets forth twelve "basic principles of accounting and reporting applicable to governmental units."[2] Statement 1 represents an updating and restatement of NCGA's 1968 edition, *Government Accounting, Auditing, and Financial Reporting*, more commonly called by the acronym GAAFR.[3] GAAFR and now NCGA Statement 1 are generally recognized as the primary authoritative statements of generally accepted accounting principles for governmental organizations.
2. Pronouncements of the American Institute of Certified Public Accountants also set forth generally accepted accounting principles for state and local government units.
3. Pronouncements of the Financial Accounting Standards Board (FASB) are often looked to by state and local governmental units and their independent auditors as GAAP. NCGA Statement 1 requires that governmental enterprise funds such as utilities and transportation systems follow GAAP applicable to business enterprises.
4. The federal government becomes involved in accounting and financial reporting practices through its grant programs, which often mandate the use of certain accounting requirements.
5. Legal requirements at the state or local level sometimes require that certain accounting and

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[1]Coopers & Lybrand and the University of Michigan, *Financial Disclosure Practices of the American Cities—A Public Report* (New York: Coopers & Lybrand, 1976).

[2]National Council on Governmental Accounting, Statement 1, *Governmental Accounting and Financial Reporting Principles* (Chicago: Municipal Finance Officers Association of the United States and Canada, 1979).

[3]National Committee on Governmental Accounting, *Governmental Accounting, Auditing, and Financial Reporting* (Chicago: Municipal Finance Officers Association of the United States and Canada, 1968).

reporting practices be followed for particular types of transactions, funds, or government entities.

Recent Developments in Government Accounting

The most significant development in accounting and reporting standards for state and local governments during the past decade has been the GAAFR Restatement Project. This project resulted in the issuance of Statement 1, which, as mentioned earlier, is a restatement of the principles of *Governmental Accounting, Auditing, and Financial Reporting* (GAAFR or the "blue book") issued in 1968. Before Statement 1, GAAFR was considered the primary authoritative statement on the application of generally accepted accounting principles to state and local governments.

The GAAFR Restatement Project represents a "modest revision" of the 1968 pronouncement in order to provide current guidance in accounting and reporting. Although many of the principles are unchanged from the 1968 pronouncement, a significant change is to incorporate pertinent aspects of the 1974 industry audit guide of the American Institute of Certified Public Accountants (AICPA), *Audits of State and Local Governmental Units* (ASLGU).[4] NCGA Statement 1 is effective for fiscal years ending after June 30, 1980, although the NCGA encourages earlier application.

The GAAFR Restatement Project has been followed by a subsequent research phase. The purpose of this phase, being long term in nature, is to develop a conceptual framework for governmental accounting and reporting. The first step in this effort has resulted in the NCGA Research Report, *A Study of Selected Concepts for Government Financial Accounting and Reporting.*[5] The study's stated objectives are to (1) explore and formulate a suggested conceptual framework for public sector financial reporting, (2) stimulate discussion, (3) provide input to other research projects, and (4) highlight other research topics. General conclusions of the study are in the areas of:

1. The important users of governmental financial statements and their information needs
2. Conflicts between GAAP and legal requirements
3. Defining the reporting entity
4. The form and level of data aggregation of financial statement presentations
5. The need for budgeting and encumbrance reporting
6. The appropriate measurement focus for governmental financial reporting

Not only has the NCGA been actively involved in improving governmental accounting and reporting practices, but also the FASB has undertaken a conceptual framework project that includes "not-for-profit" entities. In August 1977, the Board entrusted Professor Robert N. Anthony of the Harvard Business School with the task of preparing a research report identifying the objectives of financial reporting by nonbusiness organizations. This project was completed in May 1978 when the Board published the FASB Research Report, *Financial Accounting in Nonbusiness Organizations.*[6] This report identified those questions the Board would need to address in developing a conceptual framework for nonbusiness organizations.

On June 15, 1978, a Discussion Memorandum focusing on specific issues raised in the FASB Research Report was issued.[7] This was followed on March 10, 1980, by the issuance of an Exposure Draft, "Objectives of Financial Reporting by Nonbusiness Organizations."[8] Further deliberation resulted in the December 1980 publication of "Objectives of Financial Reporting by Nonbusiness Organizations."[9] Known as SFAC #4, this publication is one of a series of publications in the Board's conceptual framework project and establishes objectives of general purpose external financial reporting by nonbusiness organizations. The objectives set forth in FASB's SFAC #1, "Objectives of Financial Reporting by Business Enterprises,"[10] together with the objectives presented in SFAC #4, will serve as the foundation of the conceptual framework for financial accounting and reporting now being developed.

More recently, the widespread perception of the inadequacy of reporting in the public sector has led to a reevaluation of the present standard-setting structure. In April 1980, following a year of informal discussion, the American Institute of Certified Public Accountants (AICPA), Financial Accounting Foundation (FAF), Municipal Finance Officers Association (MFOA), National Association of State Auditors, Comptrollers, and Treasurers (NASACT), General Accounting Office (GAO), and National Council on Governmental Accounting (NCGA) established an ad hoc working committee, known as the Governmental Accounting Standards Board Organization Committee (GASBOC), to consider whether there is a need for a new structure to establish accounting and reporting requirements for state and local government.

On February 16, 1981, the GASBOC issued an Exposure Draft[11] that sets forth the following major recommendations:

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[4]Committee on Governmental Accounting and Auditing, American Institute of Certified Public Accountants, *Audits of State and Local Governmental Units* (New York: American Institute of Certified Public Accountants, 1974).

[5]William W. Holder, *A Study of Selected Concepts for Government Financial Accounting and Reporting* (Chicago: National Council on Governmental Accounting, 1980).

[6]Robert N. Anthony, *Financial Accounting in Nonbusiness Organizations: An Exploratory Study of Conceptual Issues* (Stanford, Conn.: FASB, 1978).

[7]Discussion Memorandum, "An Analysis of Issues Related to Conceptual Framework for Financial Accounting and Reporting: Objectives of Financial Reporting by Nonbusiness Organizations," FASB, 1978.

[8]Exposure Draft, Proposed Statement of Financial Accounting Standards, "Objectives of Financial Reporting by Nonbusiness Organizations," FASB, March 1980.

[9]Statement of Financial Accounting Concepts No. 4, "Objectives of Financial Reporting by Nonbusiness Organizations," FASB, December 1980.

[10]Statement of Financial Accounting Concepts No. 1, "Objectives of Financial Reporting by Business Enterprises," FASB, November 1978.

[11]Exposure Draft, "Report of the Governmental Accounting Standards Board Organization Committee," GASBOC, February 1981.

1. A new structure for developing accounting and reporting standards for governmental units should be established.
2. A separate, independent government accounting standards board (GASB) should be established.
3. Governmental accounting standards should be promulgated by an independent body that includes government representation rather than solely by government.
4. An independent Governmental Accounting Foundation should be established to have oversight and funding responsibility.
5. Members of the GASB should be full-time, with the organization located in the Washington, D.C., area.

User Needs for Information

Inherent in both the NCGA and the FASB's conceptual framework projects is the notion of "user needs." The FASB concluded in SFAC #1 that, for business enterprises, "financial reporting should provide information that is useful to present and potential investors and creditors in making rational investment and credit decisions." The Board specifies the measurement of periodic earnings as the most important function of financial accounting. In the governmental sector it is not possible to focus on a single concept such as earnings, because governmental organizations exist to provide services. Users need to be provided financial information useful for evaluating the following: (1) financial viability, (2) fiscal compliance, (3) management performance, and (4) cost of the services provided. Each of these requires further explanation.

1. *Financial Viability.* Users need information that indicates the organization's ability to continue to provide services. Viability is indicated by such information as the assets and liabilities of the organization and the relationship between resource inflows and resource outflows during a period.

2. *Fiscal Compliance.* The management of a governmental organization must comply with a number of spending mandates. Some of these are legally prescribed by external parties; others are the expressed intentions of the governing body. Users desire information about how well management has complied with mandates and whether resources have been used in the manner intended by resource contributors.

3. *Management Performance.* Management must do more than comply with mandates. It has a fundamental responsibility to spend money wisely. Users need information to evaluate the effectiveness and efficiency of managers in using the resources provided to them.

4. *Cost of Services Provided.* Most users desire information about the spending for various government programs. They may be interested in the amount spent on highways versus recreational facilities. They may also be interested in comparing the program expenditures of one government with similar expenditures of other governments.

Significant Changes

The changes in governmental accounting and reporting standards having significant and immediate impact on municipal financial reporting stem from Statement 1. The more important aspects of this statement are delineated in the following paragraphs.[12]

Although the concept of fund accounting remains unchanged, a broader classification of the funds has been adopted by grouping all the funds into three categories:

Governmental Funds: These are the funds used to finance most governmental activities. Governmental funds include general, special revenue, capital projects, debt service, and special assessment funds.

Proprietary Funds: These funds are used to account for operations that are financed and operated in a manner similar to private business enterprises. This category includes enterprise funds and internal service funds (previously called "intragovernmental service funds").

Fiduciary Funds: This category includes trust and agency funds that account for assets held by a governmental unit in a trustee capacity or as an agent for individuals, private organizations, other governmental units, and/or other funds.

Statement 1 recognizes the accrual basis of accounting as the superior method of measuring an entity's net income; however, the modified accrual basis is recommended for those funds measuring the flow of resources as opposed to those whose purpose is the determination of net income. Statement 1 indicates that the use of the modified accrual basis leads to recognition of revenue in the accounting period in which it becomes available and measurable and recognition of expenditures in the accounting period in which the fund liability is incurred, if measurable. Unmatured interest on general long-term debt and on special assessment indebtedness secured by interest-bearing special assessment levies, however, should be recognized when due. In summary, governmental fund revenues and expenditures should be recognized on the modified accrual basis, proprietary funds should recognize their revenues and expenses on the accrual basis, and fiduciary fund revenues and expenses or expenditures should be recognized on the basis consistent with the firm's accounting measurement objectives.

The 1968 pronouncement (GAAFR) required that enterprise funds be established to account for the "financing of self-supporting activities of governmental units which render services on a user charge basis to the public."[13] Statement 1 expands this definition to include its use where the costs of providing goods or services are "financed or recovered primarily through user charges" or where the management decides that periodic determination of income is important.

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[12]National Council on Governmental Accounting, Statement 1, *Governmental Accounting and Financial Reporting Principles* (Chicago: Municipal Finance Officers Association of the United States and Canada, 1979).

[13]National Committee on Governmental Accounting, *Governmental Accounting, Auditing, and Financial Reporting* (Chicago: Municipal Finance Officers Association of the United States and Canada, 1968).

The conflict between accounting principles and legal provisions has been a particularly vexing problem for accountants. GAAFR declared that legal provisions must take precedence where there is a conflict with generally accepted accounting principles. The 1974 AICPA audit guide disagreed by taking the position that GAAP should take precedence over legal provisions in external financial reporting.[14] Statement 1 takes the position that the accounting system must make it possible to both meet legal requirements as well as comply with GAAP. The accounting system may be maintained to comply with legal provisions, but sufficient additional records should be maintained to permit GAAP-based reporting in order to avoid the necessity of maintaining a separate accounting system for each objective.

Survey of Municipal Accounting in Tennessee

In order to gather evidence about the current relative degree of compliance with Statement 1, the 1979 annual reports of eight Tennessee cities were obtained and examined (see Table 1). A comparison was then made of the compliance of these cities with ten accounting principles that are of particular interest to the users of these annual reports. Although statistical conclusions are not made, this analysis is intended to provide insight into the current state of municipal accounting in Tennessee and the changes that will be necessary to comply with the recommendations of Statement 1.

Table 1

TENNESSEE MUNICIPALITIES AND THEIR POPULATIONS

Municipality	Population (1970 Census)
Oak Ridge	28,400
Kingsport	32,200
Greenville	13,722
Memphis	660,000
Portland	3,081
Athens	12,000
Nashville	469,000
Knoxville	175,000

As can be seen in Table 2, all of the municipalities except Knoxville are consistently using the modified accrual basis in recognizing governmental fund revenues (item 1). Knoxville uses the accrual basis of accounting for its capital projects funds. It also accounts for property tax revenues and interest and penalty on property taxes on a cash basis rather than on a modified accrual basis.

Fiduciary fund revenues and expenses are recognized on the accrual or modified accrual basis depending on their measurement objective (item 2). The trust funds are classified for measurement and reporting purposes as either governmental or proprietary funds. Expendable trust funds are accounted for in the same manner as

Table 2

SAMPLE COMPLIANCE WITH GAAFR AND STATEMENT 1

Recommended Principles	Oak Ridge	Kingsport	Greenville	Memphis	Portland	Athens	Nashville	Knoxville
1. Governmental fund revenues are recognized when available and measurable.	yes	yes	yes	yes	yes	yes	yes	no
2. Fiduciary fund revenues and expenses are recognized on the accrual or modified accrual basis.	yes	yes	yes	yes	yes	yes	no	yes
3. Proprietary fund revenues and expenses are recognized on the accrual or modified accrual basis.	yes	yes	yes	yes	yes	yes	yes	no
4. All financial resources are accounted for in the general fund except those required to be accounted for in another fund.	yes	yes	yes	yes	yes	yes	yes	no
5. General fixed assets are capitalized in the general fixed assets account group.	yes	yes	yes	yes	yes	no	no	no
6. Reserves are reported in the fund balance section of the governmental fund balance sheet.	yes	yes	yes	yes	yes	yes	no	yes
7. Encumbrances outstanding at year-end are reported as a reservation of fund balance.	yes	yes	yes	no	yes	yes	yes	no
8. The annual report was issued on a timely basis.	yes	no	yes	no	yes	yes	no	yes
9. Disclosure of pension plan costs was adequate.	yes	yes	yes	yes	yes	yes	no	no
10. Policies for the accumulation of vacation and sick pay were disclosed.	no	no	no	no	no	no	no	no

[14]Committee on Governmental Accounting and Auditing, American Institute of Certified Public Accountants, *Audits of State and Local Governmental Units* (New York: American Institute of Certified Public Accountants, 1974).

governmental funds, while nonexpendable trust funds and pension trust funds are accounted for in the same manner as proprietary funds. Agency funds are purely custodial and are therefore not of concern here.

Seven of the cities comply with Statement 1. The financial statements of Nashville's pension and insurance funds included in the fiduciary fund types are presented principally on the cash basis of accounting. No reason is offered for this violation of GAAP.

Only Knoxville failed to properly account for proprietary fund revenues and expenses (item 3). The basis of accounting for five of the twelve enterprise funds for the city of Knoxville was not disclosed in the financial statements or the notes thereto.

Knoxville is the only city that has failed to meet the requirement for the financial resources to be accounted for through the general fund (item 4). For reasons unexplained, the operations of the Municipal Auditorium Civic Center and the Garage are accounted for in the general fund rather than in enterprise and internal service funds, respectively.

Neither Athens, Nashville, nor Knoxville maintains records of general fixed assets and, accordingly, none of these cities includes in its financial statement a fixed asset account group as required by generally accepted accounting principles (item 5). The other municipalities do comply with the recommended standard; however, the basis of valuation (i.e., cost, appraisal, etc.) of fixed assets varies among the cities.

Statement 1 specifically limits the use of the term "reserve" in governmental fund accounting and reporting to indicating that a portion of the fund balance is not appropriable for expenditure or is legally segregated for a specific future use. Reserves should be reported in the fund balance section of governmental fund balance sheets. Statement 1 specifically prohibits classifying them as liabilities or their display between liabilities and fund balance. None of the cities in this survey reported reserves under liabilities (item 6). The reason for the "no" response was the inclusion of reserves between liabilities and fund balance, which could lead to confusion on the part of the user as to their purpose.

Encumbrances are commitments related to unperformed (executory) contracts for goods or services and are recorded for budgetary control purposes (item 7). Statement 1 states that encumbrances outstanding at year-end should be reported as a reservation of fund balance for expenditure or liquidation in the subsequent fiscal year. It is important to remember that encumbrances represent commitments only, not completed transactions. The two municipalities with "no" responses report encumbrances at year-end between liabilities and fund balance. In addition, most of the cities did not define what constitutes an encumbrance and did not describe how year-end outstanding encumbrances are accounted for in the subsequent year.

It is very important that the annual report be issued as soon as possible after the close of the period being reported (item 8). GAAFR states a preference that it be issued within sixty days after the close of the fiscal year, with ninety days being the outside limit. The issuance date of the annual reports in this sample was not determinable; however, a comparison could be made between the date of fiscal year-end and the date of the auditor's report, which represents the earliest time at which a city could publish a report. Five of the eight cities surveyed met this conservative test of timely reporting. The audit report dates of the "no" respondents ranged from four to six months.

In a period when many cities are experiencing financial difficulties, it becomes particularly important to have adequate disclosure of pension costs to enable the user to assess the ability of cities to meet their financial commitments (item 9). Although Statement 1 does not address the issue of pensions, APB Opinion No. 8 requires disclosures in the financial statements or accompanying notes of certain information about the costs of pension plans to contributing governmental units.[15] These disclosures are as follows:

1. A city should identify which plans exist and what groups or types of city employees are covered by each of the various plans, if more than one exists.
2. It should describe both its accounting policies and its funding policies for pension costs.
3. The amount of pension cost or expenditure recorded for the period should be disclosed, including the funds in which the cost has been recorded.
4. Disclosure should be made of the excess, if any, of the actuarially computed value of vested benefits over the total of the pension fund and any balance sheet pension accruals, less any pension prepayments or deferred charges.

Of the cities surveyed, only Nashville and Knoxville did not adequately disclose the cost of their pension plans. The information they presented affords the user little basis for evaluation. Nashville represents the extreme case in that it uses the cash basis of accounting for its pension funds.

Municipalities are required to disclose their policies for the accumulation of vacation or sick pay (item 10). In this survey, none of the cities made this disclosure. In fact, no disclosure of any nature applicable to vacation and sick pay was found in the financial statements.

Conclusion

This article has identified the sources of generally accepted accounting principles applicable to state and local governmental units, summarized recent major changes in those standards, and discussed the needs of those who are primary users of municipal financial reports. Particular attention has been focused on NCGA Statement 1 and the impact its recommendations will have on municipal accounting.

(Continued on page 27)

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[15]Accounting Principles Board, Opinion No. 8, "Accounting for the Cost of Pension Plans" (New York: American Institute of Certified Public Accountants, Inc., 1966).

THE MISSING LINK: HUMAN CAPITAL ASPECTS OF REINDUSTRIALIZATION

*David C. Bowles and Sarkis J. Khoury**

Over the past decade, the growth rate of real GNP in the United States has dropped below its long-run trend of nearly 3.5 percent in the post-World War II period, as well as below growth rates of many industrialized nations. Two countries in particular, Japan and to a lesser extent West Germany, have maintained relatively high and steady rates of growth during the 1970s, despite facing similar, if not more severe, obstacles in the form of substantial increases in oil prices, rising inflation rates, and worldwide recessions. Most students of the problem cite an aging United States capital stock, the comparatively higher levels of business fixed investment of high-growth countries, and unenlightened government policies with respect to human capital formation as reasons for the absolute and relative United States lethargy.

The current administration's new economic program contains several elements designed to stimulate economic growth and productivity. The parts of the plan that are aimed at spurring investment, either directly or indirectly, are (1) a reduction in personal income tax rates of 25 percent over a 3-year period and a reduction, from 28 percent to 20 percent, in the maximum tax rate on capital gains—both designed to add to saving and hence to increase the supply of loanable funds; (2) accelerated depreciation on real capital assets of all classes to reduce taxes and increase the cash flow of business firms; (3) an increase in the investment tax credit on any real asset with a life between 3 and 7 years; and (4) the reduction or elimination of unjustified, cost-increasing regulations.

The aforementioned aspects of the present economic program are attractive inducements to investment and to saving. But there is another equally important area of investment that is often neglected, despite its demonstrated significance: expenditures on human capital. Human capital is succinctly defined as resources in people, and investments therein which influence future monetary and psychic income. Human capital formation is a necessary prelude to invention, innovation, and technological progress, and without it the plans for reindustrialization through expenditures on physical capital are likely to fall short of the ultimate objective: restoration of the competitive position of the United States among industrialized nations.

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The Importance of Physical Capital

The fundamental reasons for the emphasis by the current administration on capital formation manifest themselves in the data on the economies of the United States, Japan, and Germany, which indicate that the latter two countries have higher real GNP growth rates, significantly higher savings (Japan and Germany save four and three times their American counterparts, respectively), and higher capital stock/GNP ratios for most of the 1970s, a correlation that is in accordance with standard relationships in economics.

Two additional deficiencies in the physical capital stock that are not revealed in the numbers are worth noting. First, a portion of the existing capital stock has been rendered obsolete by the 1200 percent increase in oil prices that began soon after the initial Arab oil embargo in 1973. Plants and equipment requiring oil or its derivatives for various reasons have been converted to other, more costly energy sources or have been taken off line altogether as they have become economically unfeasible to use. Second, many of the recent additions to the private fixed capital stock have been made to satisfy environmental or other governmental regulations without increasing the productive capacity of the economy.

One consequence of the inadequate capital stock in the United States is shown in the productivity data of Table 1.

Table 1

OUTPUT PER HOUR IN MANUFACTURING FOR THREE COUNTRIES

(Index: 1967=100)

Year[1]	United States	Japan	Germany
1950	65.6	21.4	37.3
1960	79.7	52.5	67.7
1970	105.1	146.6	116.1
1971	111.5	152.9	121.3
1972	117.1	168.0	128.7
1973	123.4	187.3	136.4
1974	120.5	195.0	144.7
1975	124.0	202.9	151.6
1976	129.5	221.9	161.3
1977	132.6	241.5	170.2
1978	133.8	258.0	176.3
1979	135.1	279.0	185.5

Note: The data relate to all employed persons (wage and salary earners, the self-employed, and unpaid family workers) in the United States and Canada, and all employees (wage and salary earners) in the other countries.

[1]Preliminary estimates for latest year.

Source: U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technology, December 1980.

The data in this table help us reach a not unexpected conclusion—namely, as a result of the relatively poor tools with which they have to work, American workers lag behind workers in other highly industrialized countries in increases in output per hour. The lack of expenditures on physical capital goods in the United States certainly contributed to this relative decline. A portion of this decline, however, can be ascribed to the insufficiency of human capital.

The Present Program

The economic proposals and statistics discussed above are primarily relevant to the formation of physical capital. Current plans do contain a few components that will have an effect on human capital acquisition, but the direction of the forces operating on human capital appear mixed and the intent of policymakers in this area is difficult to interpret. Specifically, the proposed policy changes portend a renewed emphasis on subsidized training and placement of unemployed workers in private-sector, non-make-work jobs—an unequivocal boost to human capital. The program, however, also calls for a reduction in National Aeronautics and Space Administration (NASA) and National Science Foundation (NSF) funds and a significant reduction in federal higher-education appropriations.[1] These steps and others, unless representing a drive to eliminate waste and inefficiencies, represent a serious error in the ranking of policy priorities, for they overlook the fact that research, educational, and training programs are long-term investments in society from which both business and government can receive dividends.

This article discusses the importance of not overlooking investment in human capital as an integral part of any reindustrialization program. The analysis concentrates on the productivity benefits of expenditures for education and training. (Health-related expenditures, although not discussed in this article, are an important part of the usual treatment of the topic.) Since the prime interest here is the productivity of the American worker, the effects of recent trends in expenditures on research and development are analyzed. Success in these activities is inextricably tied to the amount of available human capital.

Human Capital in the Reindustrialization Process

Support for the position that human capital is an important determinant of economic growth is not difficult to find. The classic study by Denison[2] of sources of economic growth (see Table 2) in the United States attributes approximately 11 percent of post-war economic growth to improvements in education, while another 33 percent is partly ascribed to the closely related category "advances in knowledge." The traditionally measured categories that cover changes in input quantities, on the other hand, account for a total of 46 percent of economic growth. The numbers for Japan and West Germany, covering slightly different time periods, further establish the importance of human capital factors. The data in this and other studies imply that a duplication of labor and capital stocks is not sufficient to explain high growth rates of the 1960s, and a similar relationship should be expected to hold in the future. If highly trained personnel are not available either to develop new technology or to generate innovations, the efforts to shore up productivity through increased physical capital formation will largely fail.[3]

Table 2

SOURCES OF ECONOMIC GROWTH: UNITED STATES COMPARED TO WEST GERMANY AND JAPAN

	United States[1] 1948-73	West Germany 1950-62	Japan 1953-71
A. Real national income	3.65	6.27	8.81
B. Total factor input	2.13	2.78	3.95
1. Capital	0.71	1.41	2.10
2. Labor	1.42	1.37	1.85
a. Employment	1.22	1.49	1.14
b. Hours of work	-0.24	-0.27	0.21
c. Education	0.41	0.11	0.34
d. Other	0.03	0.04	0.16
C. Output per unit of input	1.52	3.49	4.86
1. Decline of agriculture and self-employment	0.29	1.01	0.95
2. Residual (mainly economies of scale and contribution of advances in knowledge)	1.23	2.48	3.91

[1]Preliminary estimates for the U.S. for 1973-1976 show that education and advances in knowledge continue to play important roles in economic growth. During the three-year period, education was a positive influence, while advances in knowledge inhibited growth. For more details, see E. F. Denison, "The Puzzling Drop in Productivity," *Challenge*, May-June 1979, pp. 60-62.

Source: Edward F. Denison and William K. Chung, *How Japan's Economy Grew So Fast* (Washington, D.C.: Brookings Institution, 1976), Table 4-8, and Edward F. Denison, *Accounting for Slower Economic Growth* (Washington, D.C.: Brookings Institution, 1979), Table 8-1.

Evidence of a Decline in the Stock of Human Capital

A fundamentally sound education requires that students acquire skills in four areas: (1) reading for comprehension; (2) writing for communication; (3) philosophy for perspective; and (4) mathematics for technical and scientific competence. These skill areas can be summarized with the acronym R²PM, in place of the proverbial "3R's," to symbolize the activity level of a human mind, much as the familiar RPM stands for the revolutions per minute of a rotating object. Both hard statistical evidence and personal observations indicate a perceptible decline among American students in each of these basic categories. The value of R²PM is not being maximized. Data to support this claim at the secondary education level are presented in Table 3.

[1]See J. Hook, "House Panel Cuts 1981 College Aid, Adds $661 Million for Pell Grants," *The Chronicle of Higher Education* 22, no. 12 (May 11, 1981): 1.

[2]E. Denison, *Accounting for Slower Economic Growth* (Washington, D.C.: Brookings Institution, 1979) is the updated version of the original (1962) study.

[3]The U.S. military is a good example of this point. Military hardware is becoming increasingly sophisticated, and the various branches of the armed forces are having difficulty filling positions with individuals possessing the necessary technical competence. Although new equipment is available, therefore, skilled personnel to operate it is not.

Table 3

SAT SCORE AVERAGE FOR COLLEGE-BOUND SENIORS[1]

	Verbal	Mathematical	Median Number of School Years
1963	478	502	12.2
1967	466	492	12.3
1971	455	488	12.4
1975	434	472	12.5
1976	431	472	12.6
1977	429	470	12.6
1978	429	468	12.6
1979	427	467	12.6
1980	424	466	12.6

[1]The averages for 1963, 1967, and 1971 are estimates of the averages that would have been reported for college-bound seniors of those years if such reports had been produced.

Source: *Admissions Testing Program, National Report on College-Bound Seniors* (Princeton, N.J.: Educational Testing Service, 1980), p. 5; and *Employment and Training Report of the President* (Washington, D.C.: U.S. Department of Labor, 1980).

Although there has been a steady, if only slight, upward trend in the median number of school years completed (up from 12.2 years in 1963 to 12.6 years in 1980), Table 3 shows, just as clearly, that the preparedness of college-bound seniors, as measured by SAT scores, has steadily declined. Some of the decreases may reflect changes in the difficulty of the test itself, but it is widely believed that the poorer performance reflects poorer preparation and training as well, despite a real increase in per pupil educational expenditures from $1,350 in 1967 to more than $1,800 in 1979.

Part of the decline in verbal skills, at least during the 1970s, can be traced to a decrease in the mean number of years of study in subjects where verbal skills are stressed—namely, English, foreign languages, and social studies. In the crucial technical subjects, mathematics and the physical sciences, the mean number of years of study has actually increased throughout the sample period, yet the standardized test scores still trend downward. This correlation is especially disturbing, since it contradicts the usual (positive) relationship between the quantity of schooling and amount of human capital.

The decline can also be attributed to the attitudes of United States students toward school and technical studies, documented by Husen in 1967. Husen points out several attitudinal factors that differ across countries, which may account for the decline in the technical expertise of United States graduates.[4] For example, in categories rating the belief that math has an important role in our society, the enthusiasm for school, and the view of man as master of his own fate, the United States ranks below its high-growth rivals Japan and West Germany; the same study, however, shows that United States students have no more difficulty, on average, learning math skills.

The deficiencies in the quantitative skills of United States high school students have also been documented by Isaak Wirszup of the University of Chicago. Wirszup reports that Russian high school students are ten times better educated in math and science than American students.[5]

Unfortunately, data from standardized tests are not available for post-secondary schooling. Indirect evidence from personal observations, however, suggests possible weaknesses at this level: first, there appears to be a de-emphasis on scientific and technical subjects, except as prerequisites for medical school, business school, etc. College curricula, especially in regard to mathematics requirements, have become less rigorous.

In addition to the general decline in the rigor of educational programs, nonprofessionally oriented scientific and technical course offerings at the post-secondary level also decreased, as a result of declining enrollments throughout the 1970s. In particular, engineering programs at many colleges and universities were scaled down pari passu with the demand for engineers. Total engineering enrollment in U.S. institutions of higher education has followed a sinuous path since 1960—increasing from just over 270,000 students in 1960 to a peak of 318,500 in 1969, then falling in the early 70s to slightly less than 260,000 in 1973. The downward trend of the early 1970s has fortunately been reversed.[6]

It is also widely known that colleges and universities suffered through financially troubled times during the 70s, so the growth rate of expenditures devoted to the expansion of educational resources at this level undoubtedly declined. Many small, private institutions, in fact, were forced to close permanently.

One other set of numbers that suggests a weakening of technical human capital is figures on research and development expenditures. The evidence with regard to research and development expenditures is summarized in Figures 1, 2, and 3.[7] The figures are not reassuring. Research and development expenditures in constant dollars leveled off in the late 1960s, after a relatively steady rate of increase of over 7 percent per year in the previous decade. This general trend holds for industry as well as for the federal government. Equally significant is the slowdown in basic research expenditures in universities and colleges during the 1970s. The contribution by industry to these endeavors has been practically constant throughout the 1960-1978 period. In a comparative sense, the United States turned in the worst performance record of developed countries. Figure 1 shows the dramatic decline in United States R&D expenditures as percent of gross national product, while other countries, the Soviet Union in particular, experienced considerable if not dramatic gains.[8] The trends of Figure 2 reaffirm the evidence

[4]T. Husen, ed., *International Study of Achievement in Mathematics: A Comparison of Twelve Countries*, vols. 1 and 2 (New York: John Wiley & Sons, 1967), p. 47.

[5]I. Wirszup, "Preview Report to the National Science Foundation on Secondary Education in the Soviet Union," unpublished manuscript, 1980.

[6]See various issues of the *Digest of Education Statistics* (Washington, D.C.: U.S. Government Printing Office) for the exact figures.

[7]Figures 1, 2, and 3 are from *Science Indicators 1978* (Washington, D.C.: National Science Foundation, 1978).

[8]One must recognize that U.S.S.R. data are estimates and, in some cases, incomparable with data of other industrialized nations.

Figure 1

NATIONAL EXPENDITURES FOR PERFORMANCE OF R & D AS A PERCENT OF GROSS NATIONAL PRODUCT (GNP) BY COUNTRY: 1961 - 78

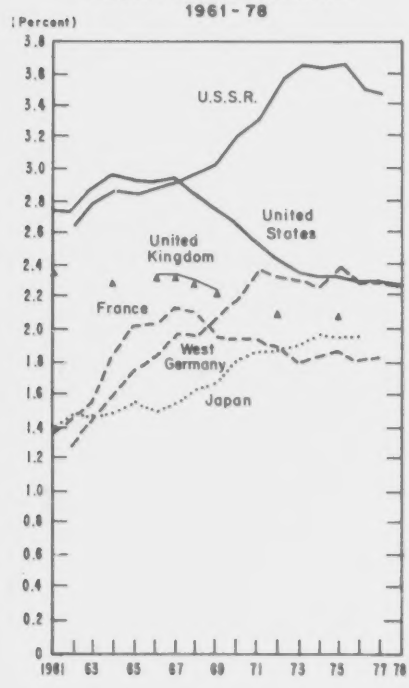


Figure 2

SCIENTISTS AND ENGINEERS ENGAGED IN R & D PER 10,000 LABOR FORCE POPULATION BY COUNTRY: 1965 - 77

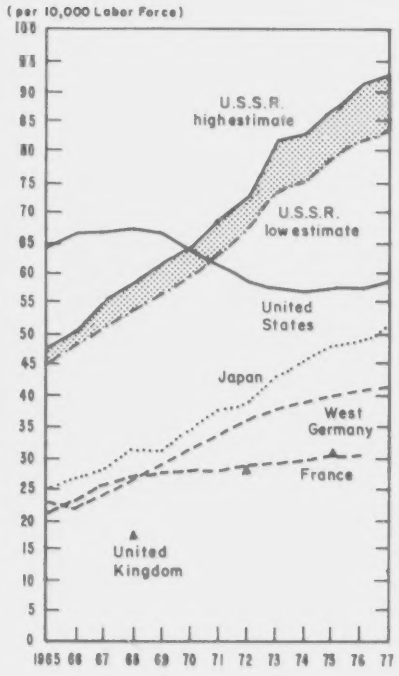
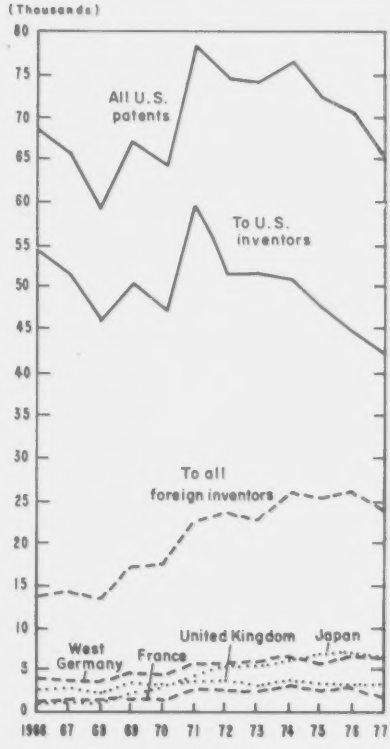


Figure 3

U.S. PATENTS GRANTED TO INVENTORS FROM SELECTED COUNTRIES BY DATE OF GRANT AND NATIONALITY OF INVENTOR: 1966 - 77



presented in Figure 1. The effects of Figures 1 and 2 are partially reflected in Figure 3, which shows that United States patents granted to United States investors dropped sharply between 1970 and 1977.

The trend in R&D expenditures has three implications for human capital growth: first, since R&D expenditures add to the existing stock of knowledge, which then aids technological progress and innovation, a decline in R&D will slow technological progress. Second, R&D expenditures often contribute indirectly to education, as principal researchers frequently use some research funds to hire assistants, who then use the funds to finance their educations. As the sources of funds, public and private, dry up, fewer apprentices will be hired, and hence the present and future advances in knowledge will come about more slowly. Third, the decline in R&D expenditures may have a feedback effect on the decline in human capital growth. If the rate of return on R&D expenditures decreases, it is only reasonable to expect that the expenditures themselves will decrease. The falling rate of return, in turn, may reflect a shortage of highly skilled labor necessary to carry out research projects with efficiency—a reflection of low rates of human capital acquisition. It seems, therefore, to be a vicious, downward-spiraling cycle: educational expenditures fall or the educational system falters ◊ poorly trained technicians ◊ decrease in return to R&D ◊ decrease in technology ◊ weak economy ◊ decline in education, etc.

How to Break the Cycle

There are many existing government programs directed toward fostering human capital growth which are worthwhile and should be continued. However, unless there is an attempt to redirect some of the resources to more scientific and technical training, the innovation and technological advances that have allowed U.S. industry to remain competitive will become victims of the spiral described above. If a concerted effort is not undertaken now, greater expenditures in the existing programs will be necessary in the future, not so much to increase the productivity edge, but simply to keep abreast of competitors. Expenditures to retrain displaced workers, for instance, will have to increase as workers get forced out of industries that are noncompetitive in world markets. The auto and steel industries are precursors of the trend.

In addition to the existing programs, government might take steps to remove deterrents to human capital accumulation. In any investment decision, the cost of capital is compared with the stream of expected benefits in order to determine the economic feasibility of the project; human capital expenditures entail a similar, if less explicit, calculation.[9] The proposed reduction in personal income tax rates, the cornerstone of the current economic

[9]See G. Becker, *Economic Theory* (New York: Alfred A. Knopf, Inc., 1971), pp. 172-83, for the analytics of this statement.

revitalization plan, is one policy change that would promote human capital growth, since the tax reduction increases the after-tax lifetime stream of income and therefore the return to investment in human capital. As long as the initial costs of developing human capital do not increase faster than tax rates decrease, an incentive for human capital formation will be created.

A reduction of the high inflation rates that have beleaguered the economy for the past 5 years is another goal of the new administration. This goal, too, is consistent with human capital formation, since high rates of inflation have adversely affected both sides of the human capital equation. For example, under the current nonindexed tax system, inflation pushes income earners into higher tax brackets, and as a result the real return to human capital—after-tax income—falls. High inflation and the associated high interest rates increase the uncertainty about the future and could further discourage human capital expenditures by decreasing the present value of the benefits derived therefrom.

The government policies described above are either in-the-works or ongoing objectives; several additional changes could be made at a reasonable cost to strengthen the incentives for human capital formation. To promote mathematics and science, for instance, government grants could be channeled to schools that maintain minimum standards or attempt to augment their course offerings in these areas. This policy would be relatively cheap to implement, since a reallocation of existing funds would not increase expenditures. The plan should also meet little resistance from colleges and universities, since they could not, publicly at least, argue against strengthening their curricula. The changing age and sex characteristics of the United States labor force in the past decade present other obstacles to human capital accumulation, which new government policies can attempt to overcome. If the remaining working life is sufficiently short, workers will hesitate to make large expenditures on human capital and employers will offer little help defraying training costs incurred by workers, since the length of the workers' returns stream will be too short to cover the cost of the investment. In order to encourage older workers, especially females entering the labor force at a later age, to acquire human capital, the government could provide tax incentives for them or their employers to help offset training costs. Although tax revenues might decrease initially, in the long run tax revenue might not fall, since the newly acquired skills of beneficiaries of the program would command higher wages on which higher income taxes would be paid. Admittedly a long-run perspective must be taken in order to justify this program, but policymakers must realize that capital accumulation is a long-term undertaking.

Attempts to slow depreciation of human capital might also prove worthwhile. Human capital depreciates as the state of the art moves forward. Because the expected returns over the remaining working life resulting from "keeping current" do not offset costs as one grows older, "maintenance" expense on human capital is unwarranted. In order to encourage workers and professionals to stay current in their fields, a way must be found to increase the returns or decrease the costs of doing so. One possible method is to offer incentives in the form of tuition tax credits, which currently exist for schooling necessary to hold one's job, and extend them to expenses incurred across a broader range, whether job related or not. The medical profession is clearly aware of this type of depreciation, as some areas of medicine require periodic reexamination of their members.

The tuition tax credits currently being discussed represent another means of reconstituting and enhancing human capital. To encourage the desired redirection of resources, for example, Congress may wish to set a minimum and a maximum percentage on deductible tuition costs, with the minimum going to those who study areas least beneficial to the production process and the maximum percentage to those whose potential contribution is highest (e.g., scientists and engineers). The tax cuts would partly offset recently proposed reductions in student financial aid, which, according to some estimates, would eliminate the educational grants of approximately 100,000 students.

Several policy changes may also be in order to stimulate technical research. A change in the tax laws to allow inventors to keep a larger share of profits derived from major technological breakthroughs is one alternative. Another possibility is a change in the patent laws similar to the proposal recently introduced in the Congress, called the Patent Term Restoration Act of 1981, which seeks to extend the life of any patent by the amount of time used in the regulatory review process. Since the review process can now take up to 10 years for some pharmaceuticals, patent holders would be able to increase their earnings by substantial amounts, and in some cases the additional returns may be sufficient to induce new research.

Finally, the United States might attempt to bolster its technical research efforts by promoting a centralized research and development complex similar to the Japanese city Tsukuba. In an effort to boost already burgeoning scientific and technical progress, the Japanese government has assisted in the planning and funding of this unique research city in which universities as well as privately sponsored research institutes may flourish.

Summary

Statistics presented in this article show that physical capital formation in the United States lags behind that of high economic growth countries such as Japan and West Germany. Consequently, in accordance with standard economic relationships, the relatively low GNP growth rates experienced in the United States in the past decade should be expected. The current administration has attempted to rectify the situation by proposing new tax incentives that make saving and investment more attractive. Most productivity and growth studies also find evidence that human capital formation is imperative for superior rates

of economic growth. The current economic program appears to place too little emphasis on the importance of this type of capital formation.

A casual, nonscientific correlation of the data on SAT scores, engineering enrollments, R&D expenditures, and the growth rate of primary and secondary educational expenditures shows that the falling growth rate of output in the United States corresponds roughly with the decrease in human capital formation. This article has indicated several ways in which existing government programs might be redirected in order to facilitate the acquisition of human capital; it has also suggested several additional incentives that might be offered to increase the stock of human capital or at least slow its depreciation.

DEMARKETING AND THE PETROLEUM INDUSTRY
(Continued from page 7)

Has Demarketing Worked?

From all indications, demarketing may be working *too well.* According to an article in the *Wall Street Journal* on March 30, 1981, the first quarter of oil decontrol shows the following results:

> Major U.S. oil companies will report almost across-the-board declines in first quarter earnings, the first such drop in six years.
>
> Bulging inventories and a world-wide slump in demand have led to losses. . . . The oil companies received only 15% to 20% of the increase in crude oil prices in the U.S. since the bulk of the increase goes to the federal government via the "windfall profits" tax on oil company revenue. . . . Gasoline and heating oil are going unwanted. Consumption is down about 7% from 1980. . . . The nation's refineries [due to low demand] are running at just 68.7% of capacity.[25]

This article has discussed how the oil shortage began and how demarketing and its strategies were used by the oil industry when demand exceeded supply. It has also examined the "painful" effects upon consumers and the powerful role government has played during the demarketing effort.

From the examples given in this article, it is felt that oil demarketing has resulted in decreasing demand for petroleum-based products. The change in demand has taken some time to accomplish, but it has taken awhile for consumers to believe that a shortage really existed.

Perhaps the best outcome of the oil shortage is that it has reminded the world that all resources are finite. As a result, we can no longer allow waste to occur without one day paying for the extravagance.

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[25]Steve Mufson, "Major U.S. Oil Firms Are Expected to Post Declines in First Quarter Profit of Up to 25%," *The Wall Street Journal,* Mar. 30, 1981, sec. 1, p. 3.

FINANCIAL REPORTING FOR MUNICIPALITIES
(Continued from page 21)

An analysis of the financial reports of eight Tennessee municipalities has been made to exemplify the current state of municipal accounting and to identify the changes necessary in order to comply with current GAAP. It is clear from this analysis that many municipalities will have to extensively modify their accounting and reporting systems in the future if compliance is to be achieved. City officials and financial managers must be aware of the changes promulgated by Statement 1 so they may plan for the orderly, systematic transition to improved reporting models.

U. S. CONSUMER PRICE INDEX W[1] (UNADJUSTED)
1967 = 100

	1974 CPI	1975 CPI	1976 CPI	1977 CPI	1978 CPI	1979 CPI	1980 CPI	Percent Change Month Ago	Percent Change Year Ago	1981 CPI	Percent Change Month Ago	Percent Change Year Ago	1982 CPI	Percent Change Month Ago	Percent Change Year Ago	1983 CPI	Percent Change Month Ago	Percent Change Year Ago
Jan.	139.7	156.1	166.7	175.3	187.1	204.7	233.3	+ 1.4	+14.0	260.7	+ 0.8	+ 11.7						
Feb.	141.5	157.2	167.1	177.1	188.4	207.1	236.5	+ 1.4	+14.2	263.5	+ 1.1	+ 11.4						
March	143.1	157.8[a]	167.5	178.2	189.7	209.3	239.9	+ 1.4	+14.6	265.2	+ 0.6	+ 10.5						
April	143.9[a]	158.6	168.2	179.6	191.4	211.8	242.6	+ 1.1	+14.5	266.8	+ 0.6	+ 10.0						
May	145.5[a]	159.3	169.2	180.6	193.3	214.3	245.1	+ 1.0	+14.4	269.1	+ 0.9	+ 9.8						
June	146.9[a]	160.6	170.1	181.8	195.3	216.9	247.8	+ 1.1	+14.2									
July	148.0[a]	162.3	171.1	182.6	196.7	219.4	248.0	+ 0.1	+13.0									
Aug.	149.9[a]	162.8[a]	171.9	183.3	197.7	221.5	249.6	+ 0.6	+12.7									
Sept.	151.7[a]	163.6	172.6	184.0	199.1	223.7	251.9	+ 0.9	+12.6									
Oct.	153.0[a]	164.6	173.3	184.5	200.7	225.6	254.1	+ 0.9	+12.6									
Nov.	154.3[a]	165.6	173.8	185.4	201.8	227.6	256.4[a]	+ 0.9[a]	+12.7[a]									
Dec.	155.4	166.3	174.3	186.1	202.9	230.0	258.7	+ 0.9	+12.5									
Annual	147.7	161.2	170.5	181.5	195.3	217.7	247.0											
Annual Change-%	11.0	9.1	5.8	6.5	7.6	11.5	13.5											

[a]Revised.

[1]The Revised CPI for Urban Wage Earners and Clerical Workers is an updated version of the "old" index and uses a broader market basket based on a expenditure survey conducted in 1972 and 1973. For analytical purposes, the CPI-W is comparable to the "old" CPI.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

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